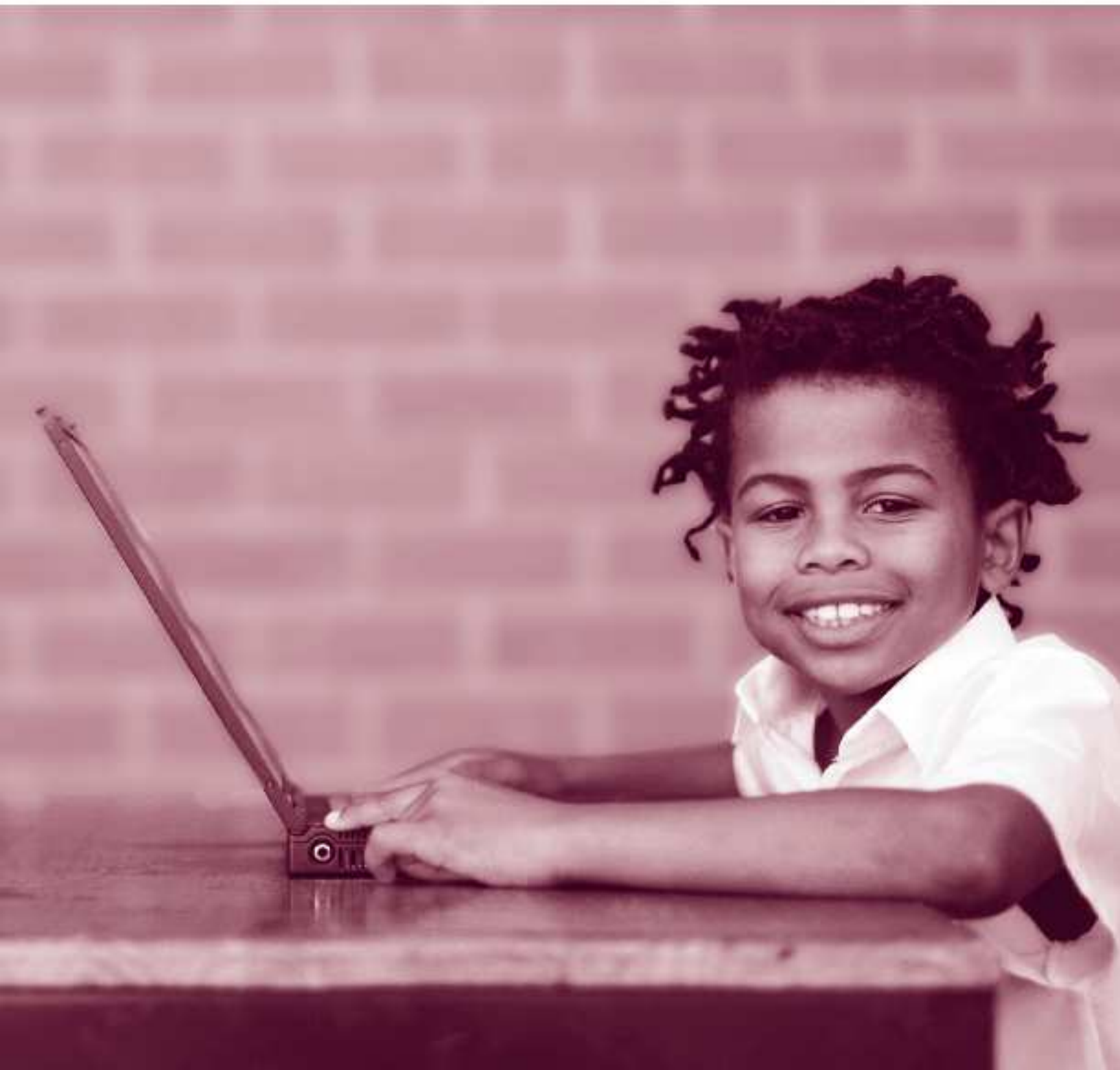




**State Strategies and Practices for Educational Technology:
Volume II—Supporting Mathematics Instruction
with Educational Technology**



State Strategies and Practices for Educational Technology: Volume II—Supporting Mathematics Instruction with Educational Technology

U.S. Department of Education
Office of Planning, Evaluation and Policy Development

Prepared by:
Karen Mitchell
Marianne Bakia
Edith Yang

SRI International

2007

This report was prepared for the U.S. Department of Education under Contract Number ED-01-C0-0133 with SRI International. Bernadette Adams Yates served as the project manager. The views expressed herein do not necessarily represent the positions or policies of the Department of Education. No official endorsement by the U.S. Department of Education is intended or should be inferred.

U.S. Department of Education

Margaret Spellings
Secretary

Office of Planning, Evaluation and Policy Development

Kerri L. Briggs
Acting Assistant Secretary

Policy and Program Studies Service

Alan Ginsburg
Director

Program and Analytic Studies Division

David Goodwin
Director

February 2007

This report is in the public domain, except for the photograph on the front cover, which is used with permission and copyright, 2005, Getty Images. Authorization to reproduce this report in whole or in part is granted. While permission to reprint this publication is not necessary, the suggested citation is: U.S. Department of Education; Office of Planning, Evaluation and Policy Development; Policy and Program Studies Service, *State Strategies and Practices for Educational Technology: Volume II—Supporting Mathematics Instruction with Educational Technology*, Washington, D.C., 2007.

To order copies of this report, write:

ED Pubs
Education Publications Center
U.S. Department of Education
P.O. Box 1398
Jessup, MD 20749-1398

To order via fax, dial (301) 470-1244. You may also call toll-free: 1-877-433-7827 (1-877-4-ED-PUBS). If 877 service is not yet available in your area, call 1-800-872-5327 (1-800-USA-LEARN). Those who use a telecommunications device for the deaf (TDD) or a teletypewriter (TTY) should call 1-800-437-0833.

To order online, point your Internet browser to: www.edpubs.org.

This report is also available on the Department's Web site at www.ed.gov/about/offices/list/opepd/ppss/reports.html.

On request, this publication is available in alternate formats, such as Braille, large print, or computer diskette. For more information, please contact the Department's Alternate Format Center at (202) 260-9895.

Contents

LIST OF EXHIBITS	iv
ACKNOWLEDGMENTS.....	v
PREFACE TO VOLUME II.....	vii
EXECUTIVE SUMMARY	1
Introduction	1
About This Report	1
Key Findings.....	1
Conclusions	5
CHAPTER 1: SUPPORTING MATHEMATICS INSTRUCTION WITH EDUCATIONAL TECHNOLOGY	7
Introduction	9
Key Findings.....	10
Teachers’ and Students’ Access to Educational Technology in Mathematics	10
Mathematics Teachers’ Use of Technology in Instructional Planning and Delivery.....	14
Students’ Use of Technology in Mathematics Learning.....	19
Teachers’ Use of Technology for Student Assessment in Mathematics.....	21
Technology-Related Teacher Professional Development	24
Conclusions	26
Next Steps.....	26
CHAPTER 2: INDIVIDUAL STATE PROFILES OF TECHNOLOGY IN MATHEMATICS INSTRUCTION.....	27
REFERENCES	81
APPENDIX A REPORT METHODOLOGY	85
NAEP Administration Data from 2005	87
Elements for Individual State Profiles	87

Exhibits

Exhibit ES-1. Percentage of Students With Access to Computers for Mathematics Instruction in 2004–05	2
Exhibit ES-2. Differences Between States in the Percentage of Students With Classroom Computers in Mathematics in 2004–05.....	3
Exhibit ES-3. Percentage of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05.....	4
Exhibit ES-4. Percentage of Students Who Used Computers in Mathematics at Least Once a Week in 2004–05	5
Exhibit 1. Percentage of Students With Access to Computers for Mathematics Instruction in 2004–05	10
Exhibit 2. Differences Between States in the Percentage of Students With Classroom Computers in Mathematics in 2004–05.....	11
Exhibit 3. Percentage of Students with a Computer for Every Four or Fewer Students and Every Five or More Students in Mathematics Classrooms in 2004–05.....	12
Exhibit 4. Percentage of Students Whose Teachers Had Access to Software for Mathematics Instruction and Technical Support to Answer Computer Questions in 2004–05	13
Exhibit 5. Differences Between States in the Percentage of Students Whose Teachers Had Access to Software for Math Instruction in 2004–05.....	14
Exhibit 6. Percentage of Students Whose Teachers Used Computers in Mathematics Curriculum Planning at Least Once a Week in 2004–05	15
Exhibit 7. Differences Between States in the Percentage of Students Whose Teachers Used Computers in Curriculum Planning at Least Once a Week in 2004–05.....	16
Exhibit 8. Differences Between States in the Percentage of Students Whose Teachers Used Computers at Least Once a Week in 2004–05 to Look Up Mathematics Information	17
Exhibit 9. Percentage of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05.....	18
Exhibit 10. Differences Between States in the Percentage of Students Whose Teachers Used Computers at Least Once a Week in 2004–05 to Present Mathematics Concepts to Students	19
Exhibit 11. Percentage of Students Who Used Computers in Mathematics at Least Once a Week in 2004–05	20
Exhibit 12. Differences Between States in the Percentage of Students Who Used Computers at Least Once a Week in 2004–05 to Practice or Review Math	21
Exhibit 13. Percentage of Students Whose Teachers Used Technology to Administer Mathematics Tests in 2004–05	22
Exhibit 14. Differences Between States in the Percentage of Students Whose Teachers Used Technology to Administer Whole-Class Mathematics Tests in 2004–05.....	23
Exhibit 15. Differences Between States in the Percentage of Students Whose Teachers Used Technology to Administer Mathematics Tests to Individuals in 2004–05	24
Exhibit 16. Percentage of Students Whose Teachers Had Access to District- or School-Provided Professional Development on the Use of Technology in Mathematics Instruction in 2004–05	25
Exhibit 17. Differences Between States in the Percentage of Students Whose Teachers Had Access to District- or School-Provided Professional Development on the Use of Technology in Mathematics Instruction in 2004–05.....	25
Exhibit A-1. Educational Technology Access and Integration.....	88

Acknowledgments

This two-volume report was developed under the guidance of staff from the U.S. Department of Education, Office of Planning, Evaluation and Policy Development. Bernadette Adams Yates of the Policy and Program Studies Service was the project manager.

The National Educational Technology Trends Study (NETTS) is the result of collaborative work by SRI International (SRI), the Urban Institute, and the American Institutes for Research (AIR). Barbara Means, SRI, serves as project supervisor. Among the staff who contributed to the design of the study, collection of data, and analysis were Carol Conroy, David Keefe, Graham Keyes, Benita Kim, Raymond McGhee, Natalie Nielsen, Andrew Wayne, Jennifer Scott, and Kaily Yee from SRI; Duncan Chaplin, David Chase, Sheila Isanaka, and Daniel Klasik of the Urban Institute; Rob Santos of NuStats under contract with the Urban Institute and Michael Puma of Chesapeake Research Associates under contract with the Urban Institute; and Hilary Cedarquist, Doug Levin, and Mindee O’Cummings from AIR. Layout and editing were performed by staff at SRI, including Bonnee Groover, Crystal Hoban, Kara Murray, and Klaus Krause. Graphics were produced by Lynne Peck Theis.

The authors would like to thank the state and district staff who participated in the NETTS data collection efforts; staff from 50 state education authorities (and the District of Columbia and Puerto Rico) and 916 school districts completed surveys. In particular, state staff from our six case study states—Kansas, Massachusetts, Ohio, Texas, Washington, and West Virginia—generously provided staff time and resources before, during, and after site visits. We learned a great deal from these individuals and hope the lessons gained from their efforts will be of use to policymakers and other staff at all levels of the education system.

An external advisory panel provided assistance in reviewing study methods and materials and prioritizing issues to investigate. The advisory panel consisted of Tim Best of the Ohio Board of Regents, Geneva Haertel of SRI International, Alan Lesgold of the University of Pittsburgh, Jayne Moore of the Maryland State Department of Education, Michael Russell of Boston College, Fritz Scheuren of the National Opinion Research Center (NORC), Linda Tsantis of Johns Hopkins University, and Brenda Williams of the West Virginia Department of Education. We thank them for their expertise and insights so generously shared.

Preface to Volume II

This is the second volume of *State Strategies and Practices for Educational Technology* by the National Educational Technology Trends Study (NETTS). NETTS is a federally sponsored evaluation of the Enhancing Education Through Technology (EETT) program, a program authorized by Title II, Part D, of the *Elementary and Secondary Education Act of 1965 (ESEA)*, which was reauthorized as the *No Child Left Behind Act of 2001 (NCLB)*.

Volume II, *Supporting Mathematics Instruction with Educational Technology*, examines the degree to which technology is used for mathematics instruction in fourth- and eighth-grade classes across the country and compares differences across states. The report analyzes data from surveys of teachers collected as part of the 2005 National Assessment of Educational Progress (NAEP).

Executive Summary

Introduction

On Jan. 31, 2006, the White House announced the American Competitiveness Initiative. In his State of the Union address, the president vowed to encourage American innovation and to strengthen the nation's ability to compete in the global economy. A cornerstone of the initiative is a \$380-million plan to improve education so that all elementary and secondary school students in the United States finish high school with a strong foundation in mathematics, science, and technology. Building on the foundation of the *Elementary and Secondary Education Act of 1965 (ESEA)*, as amended by the *No Child Left Behind Act of 2001 (NCLB)*, the initiative seeks to raise student achievement in mathematics and science through testing and accountability, grants for targeted interventions, and curricula based on proven methods of instruction. Among the programs included in the American Competitiveness Initiative are new math programs for elementary and middle school students to help promote promising and research-based practices in math instruction, prepare students for more rigorous math courses, and diagnose and remedy the deficiencies of students who lack math proficiency.

Shortly before the president unveiled his plan, the U.S. Department of Education released the results of the 2005 National Assessment of Educational Progress (NAEP). The 2005 NAEP was administered to students in more than 17,600 schools across the country. Mathematics and science assessments were administered to students in grades four, eight, and 12. Teachers in classrooms where fourth- and eighth-grade students took the NAEP mathematics assessment completed surveys about their instructional practices in 2004–05. The surveys included questions about educational technology. These data describe teachers' and students' access to technology and the uses that they make of it as they do their work in mathematics. Given the attention that the American Competitiveness Initiative places on mathematics and educational technology, these data provide an important benchmark for progress in teachers' and students' use of technology in mathematics instruction. The 2005 NAEP data on technology use in mathematics are the subject of this report.¹

About This Report

This report describes educational technology access and use in fourth- and eighth-grade mathematics classrooms all across the country, and it makes comparisons between states' technology resources. Part 1 provides national data and documents differences between states in teachers' and students' access to instructional technology, in teachers' efforts to integrate technology in mathematics instruction and assessment, in students' use of technology in mathematics learning, and in the technology-related development and support that states provide to teachers. These data are provided in Chapter 2 on a state-by-state basis.

Key Findings

- **In school year 2004–05, most students were in schools with access to computers that could be used for mathematics instruction (Exhibit ES-1).**

Seventy-five percent or more of students were in schools where they had access to computers. In a number of states, almost all students had access to computers within their classrooms or in computer labs or media centers.

¹ Data on technology use were not gathered from science teachers during the 2005 NAEP administration.

Exhibit ES-1. Percentage of Students With Access to Computers for Mathematics Instruction in 2004–05

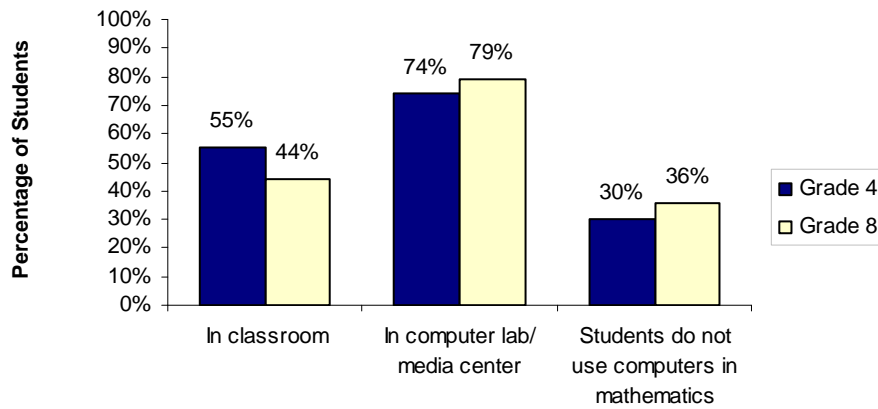


Exhibit reads: Fifty-five percent of fourth-graders and 44 percent of eighth-graders had access to computers in mathematics classrooms. Seventy-four percent of fourth-graders and 79 percent of eighth-graders had access to computers for mathematics in school computer labs or media centers. Thirty percent of fourth-graders and 36 percent of eighth-graders did not use computers in mathematics. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

There was variability among states in students' access to classroom computers in 2004–05. In some states, 20 percent or more of fourth- and eighth-grade students were in mathematics classrooms with computers; in other states, 60 percent or more of fourth- and eighth-graders were in mathematics classrooms that had computers (Exhibit ES-2).

Exhibit ES-3. Percentage of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

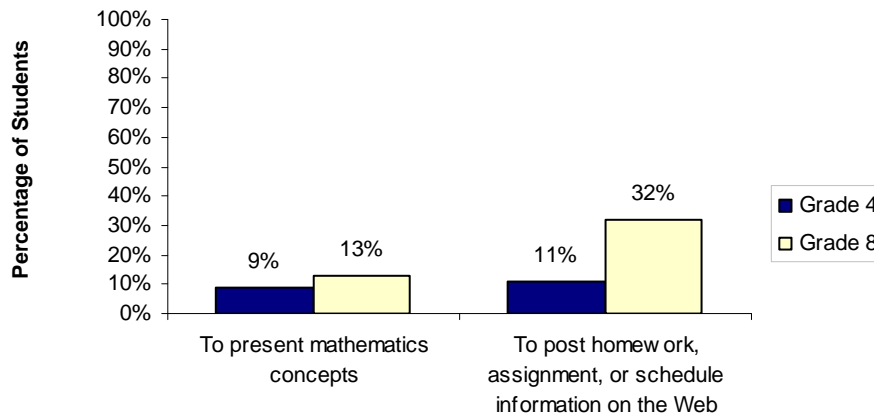


Exhibit reads: The teachers of 9 percent of fourth-graders and 13 percent of eighth-graders used computers at least once a week to present mathematics concepts. The teachers of 11 percent of fourth-graders and 32 percent of eighth-graders used computers at least once a week to post homework, assignment, or schedule information on the Web. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

- **In mathematics classes, technology was more likely used by students than by their teachers.**

Thirty percent of fourth-grade students and 11 percent of eighth-grade students used computers at least once a week to practice or review mathematics topics, and roughly 25 percent to 30 percent, respectively, used computers to extend mathematics learning with enrichment activities (Exhibit ES-4). There was considerable variation in student use across states, however. In some states, as many as 70 percent of fourth-grade students used computers at least once a week for practice or review in mathematics; in others, fewer than 10 percent did.

Exhibit ES-4. Percentage of Students Who Used Computers in Mathematics at Least Once a Week in 2004–05

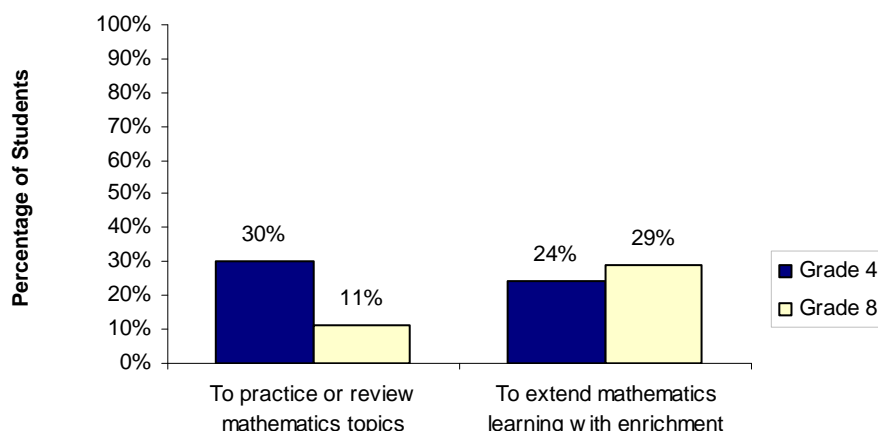


Exhibit reads: Thirty percent of fourth-graders and 11 percent of eighth-graders used computers at least once a week to practice or review mathematics topics. Twenty-four percent of fourth-graders and 29 percent of eighth-graders used computers at least once a week to extend mathematics learning with enrichment activities. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

- **A substantial minority of teachers used technology for student assessment in school year 2004–05.**

Twenty to 25 percent of students were in classrooms in which teachers reported at least occasional use of computers to administer whole-class or individualized tests in mathematics. There was variability among states in levels of use. At one end of the spectrum was a state where more than 40 percent of students had teachers who reported using technology for whole-class testing in mathematics. At the other end was a state where only about 5 percent of students did.

- **Survey responses of mathematics teachers suggest that in 2004–05 almost half of America’s students were in classrooms where teachers lacked access to district- or school-provided professional development on the use of computers for mathematics instruction.**

Conclusions

With increased attention to mathematics instruction and students’ technology literacy, these findings are timely. The 2005 NAEP data suggest that classroom use of technology in mathematics classes remains modest. Differences between states in the use of technology for curriculum development, teaching, and assessment are as large as 40 percentage points.

The possible explanations for teachers’ and students’ modest use of technology in mathematics are numerous. They include insufficiencies in hardware and support and the many reasons that it is difficult for teachers to access and profit from teacher professional development. Among these are the difficulty of finding time to take technology-related training, the abbreviated nature of many professional development offerings, insufficient opportunities for immediate and frequent practice of

what teachers learn in training, the paucity of follow-up and advanced training on technology use, and the latitude that teachers need to try new and potentially ineffective (at least at first) technologies in their classrooms.

The next administration of the NAEP mathematics assessment to fourth- and eighth-graders is scheduled for 2007. Fourth- and eighth-grade mathematics teachers will be surveyed about their instructional practices in conjunction with the assessment. Examined together, the 2005 and 2007 data can be used to describe national and statewide trends in the use of educational technology in mathematics classrooms by students and their teachers.

**CHAPTER 1: SUPPORTING MATHEMATICS
INSTRUCTION WITH EDUCATIONAL TECHNOLOGY**

Introduction

On Jan. 31, 2006, the White House announced the American Competitiveness Initiative. In his State of the Union address, the president vowed to encourage American innovation and to strengthen the nation's ability to compete in the global economy. A cornerstone of the initiative is a \$380-million plan to improve education so that all K–12 American students finish high school with a strong foundation in mathematics, science, and technology. Building on the foundation of the *Elementary and Secondary Education Act of 1965 (ESEA)*, as amended by the *No Child Left Behind Act of 2001 (NCLB)*, the initiative seeks to raise student achievement in mathematics and science through testing and accountability, grants for targeted interventions, and curricula based on proven methods of instruction.

The American Competitiveness Initiative includes a number of new and expanded programs; among them are:

- New math programs for elementary and middle school students to help promote promising and research-based practices in math instruction, prepare students for more rigorous math courses, and diagnose and remedy the deficiencies of students who lack math proficiency.
- In-service development for new Advanced Placement and International Baccalaureate teachers who work in schools that serve low-income families.
- Preservice development for up to 30,000 math and science professionals so they can become adjunct high school teachers.

Shortly before the president unveiled his plan, the U.S. Department of Education released the results of the 2005 National Assessment of Educational Progress (NAEP). The 2005 NAEP was administered to students in more than 17,600 schools across the country. Mathematics and science assessments were administered to students in grades 4, 8, and 12. The achievement data from the 2005 NAEP administrations were widely reported (Grigg, Lauko, and Brockway, 2006; NCES, 2005b; NCES, 2006; Perie, Grigg and Dion, 2005).³ These data describe student achievement in mathematics and science at the time the American Competitiveness Initiative was announced, and they serve as an important benchmark for progress in students' achievement.

Also available from the 2005 NAEP administration are data on the use of educational technologies in mathematics classrooms. Teachers in classrooms in which students took the NAEP mathematics assessment completed surveys about their instructional practices. The surveys included questions about educational technology. These data describe teachers' and students' access to technology and the uses that they make of it as they do their work in mathematics. Given the attention that the American Competitiveness Initiative places on mathematics and educational technology, these data provide important baseline information. The 2005 NAEP data on technology use in mathematics are the subject of this report.⁴

³ Data on the 12th-grade mathematics assessment will be reported in the summer of 2006.

⁴ Data on technology use were not gathered from science teachers during the 2005 NAEP administration.

Key Findings

This part of the report provides data from the 2005 NAEP administration on the uses of educational technology in fourth- and eighth-grade mathematics classrooms across the country during school year 2004–05. It describes educational technology access and use nationally, and it makes comparisons between states' technology resources. It provides national data and documents differences between states in teachers' and students' access to instructional technology, in teachers' efforts to integrate technology in mathematics instruction and assessment, in students' use of technology in mathematics learning, and in the technology-related professional development and support that states provide to teachers. Data are provided on a state-by-state basis in Chapter 2 of the report.

Teachers' and Students' Access to Educational Technology in Mathematics

In 2005, mathematics teachers surveyed in conjunction with the NAEP administration reported on the availability of computers in their classrooms and schools and on the availability of software for mathematics instruction. Teachers also described their access to technical support. Exhibit 1 provides national data on the reported availability of computers in fourth- and eighth-grade mathematics classrooms and in school media labs and computer centers in 2004–05.

Mathematics teachers reported that many students had access to computers for mathematics instruction in fourth- and eighth grades in school year 2004–05 (Exhibit 1). Just over half of American fourth-graders were in mathematics classrooms with access to computers; the percentage of eighth-graders with access to computers in their mathematics classrooms was slightly lower. The majority of students were in schools in which they could use computer labs or media centers for mathematics. More than 70 percent of fourth- and eighth-graders had access to technology for mathematics instruction in school computer labs or media centers.

Despite relatively high levels of access, students' use of computers in mathematics in 2004–05 was not ubiquitous. Teachers reported that 30 percent of fourth-graders and 36 percent of eighth-graders were in classes that did not make use of computers in mathematics.

Exhibit 1. Percentage of Students With Access to Computers for Mathematics Instruction in 2004–05

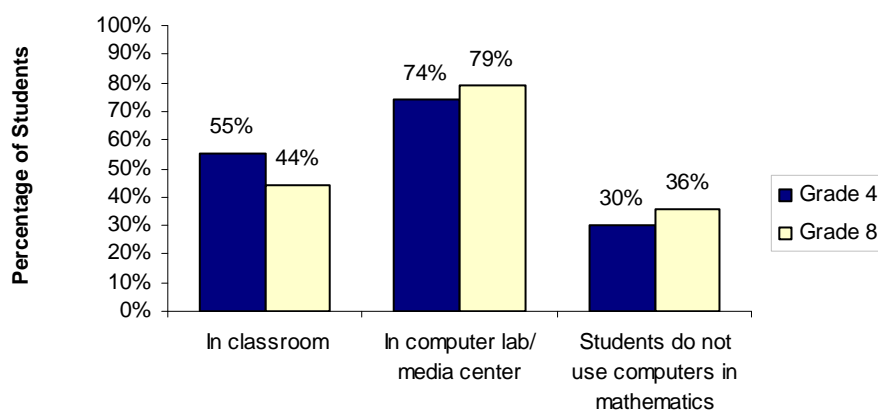


Exhibit reads: Fifty-five percent of fourth-graders and 44 percent of eighth-graders had access to computers in mathematics classrooms. Seventy-four percent of fourth-graders and 79 percent of eighth-graders had access to computers for mathematics in school computer labs or media centers. Thirty percent of fourth-graders and 36 percent of eighth-graders did not use computers in mathematics. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

that had computers for every four or fewer students; a similar percentage of students were in classrooms where computers were shared by five or more students.

Exhibit 3. Percentage of Students with a Computer for Every Four or Fewer Students and Every Five or More Students in Mathematics Classrooms in 2004–05

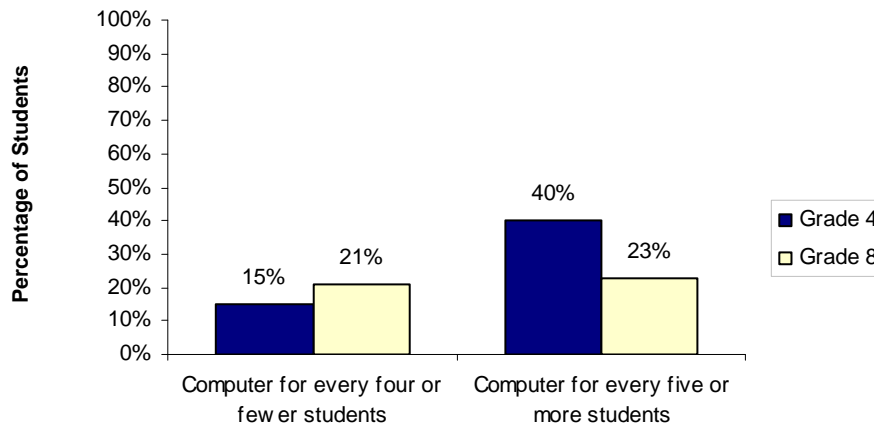


Exhibit reads: Fifteen percent of fourth-graders and 21 percent of eighth-graders were in mathematics classrooms in which computers were available for every four or fewer students. Forty percent of fourth-graders and 23 percent of eighth-graders were in classrooms in which computers were shared by five or more students. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 4 provides data on teachers' access to software for mathematics instruction. It also provides information on teachers' access to technical support for computer use.

In 2004–05 the majority of students were in classrooms in which teachers had access to software for mathematics instruction and had technical support for their technology use (Exhibit 4). More than 70 percent of fourth- and eighth-grade students had teachers with access to software for mathematics instruction. Almost all students had teachers with access to technical support to answer computer questions.

Exhibit 4. Percentage of Students Whose Teachers Had Access to Software for Mathematics Instruction and Technical Support to Answer Computer Questions in 2004–05

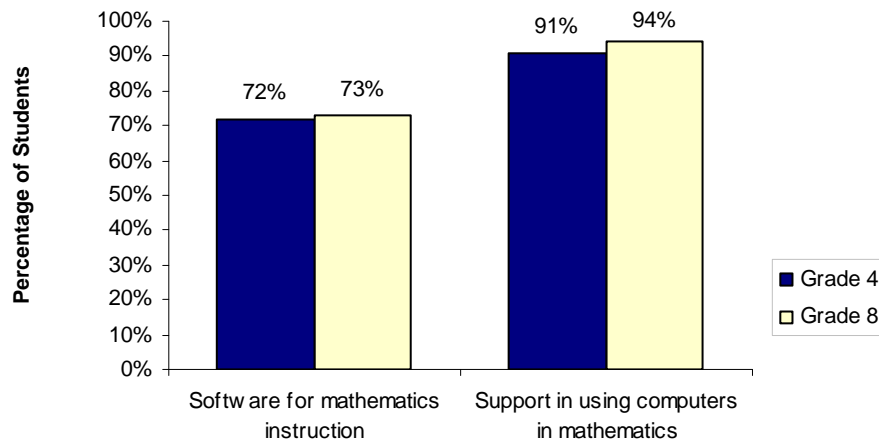


Exhibit reads: The teachers of 72 percent of fourth-graders and 73 percent of eighth-graders had access to software for mathematics instruction. The teachers of 91 percent of fourth-graders and 94 percent of eighth-graders had technical support in their schools to answer computer questions. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 5 presents some of these same data on a state-by-state basis. It shows differences between states in teachers' access to software for mathematics instruction.

There was notable variability between states in the percentage of students whose teachers had access to software on mathematics instruction (Exhibit 5). In one state, just over 40 percent of students had teachers who reported having access to software for mathematics instruction; in others, over 80 percent of students had teachers who reported having access to mathematics software.

Exhibit 5. Differences Between States in the Percentage of Students Whose Teachers Had Access to Software for Math Instruction in 2004–05⁶

0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Percentage of Students in Grade 4									
Percentage of Students in Grade 8									

0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Percentage of Students in Grade 4									
Percentage of Students in Grade 8									

Exhibit reads: The percentage of fourth-grade students whose teachers had access to software for mathematics instruction ranged from just over 40 percent to over 80 percent across states. The range went from just over 40 percent to over 80 percent for eighth-graders. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Mathematics Teachers’ Use of Technology in Instructional Planning and Delivery

Exhibit 6 provides data on the percentage of U.S. students whose teachers used technology once a week or more often to develop curricula or assignments in mathematics. It also shows the percentage of students whose teachers used technology to look up information about mathematics in curriculum planning at least once a week.

In 2004–05 about a quarter of fourth-grade students had teachers who used technology at least once a week in mathematics curriculum development; more than twice as many eighth-grade mathematics students did (Exhibit 6). Fewer students had teachers who used technology to look up information about mathematics in curriculum planning. The teachers of 16 percent of fourth-grade students and about twice as many eighth-grade students looked up mathematics information on the Internet or a CD-ROM at least weekly.

⁶ The state-to-state differences shown in Exhibit 5 are statistically significant. Using a between-groups heterogeneity statistic for each variable and grade, the null hypothesis of equal true values for states was rejected at the alpha = 0.01 level.

Exhibit 6. Percentage of Students Whose Teachers Used Computers in Mathematics Curriculum Planning at Least Once a Week in 2004–05

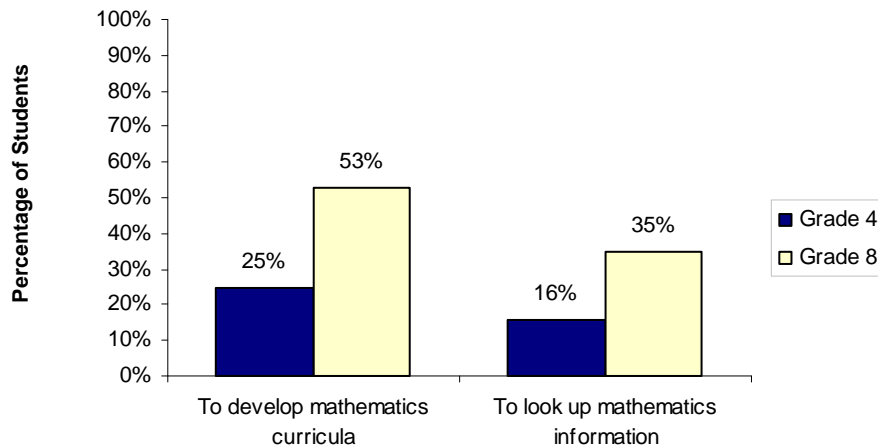


Exhibit reads: The teachers of 25 percent of fourth-graders and 53 percent of eighth-graders used computers at least once a week to develop mathematics curricula or assignments. The teachers of 16 percent of fourth-graders and 35 percent of eighth-graders used computers at least once a week to look up mathematics information. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 7 and Exhibit 8 display differences between states in teachers’ use of computers in curriculum planning. They provide state-by-state data on the percentages of students whose teachers used computers in curriculum development and to do research on mathematics topics.

There was variability between states in teachers’ use of computers in curriculum development in 2005 (Exhibit 7 and Exhibit 8). In some states as few as 10 percent of fourth-grade students had teachers who used technology on a weekly basis to create mathematics curricula or assignments. In other states, over 30 of students had teachers who did. The teachers of more eighth-grade students than fourth-grade students used computers for mathematics curriculum planning in school year 2004–05. In some states over 60 percent of eighth-grade students had teachers who used computers for curriculum development. On average, fewer fourth- and eighth-graders had teachers who used computers on a weekly basis to look up information about mathematics. For fourth-graders, the range went from under 10 percent to over 30 percent; for eighth-graders, the range went from just over 20 percent to over 50 percent.

Exhibit 8. Differences Between States in the Percentage of Students Whose Teachers Used Computers at Least Once a Week in 2004–05 to Look Up Mathematics Information⁸

0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Percentage of Students in Grade 4									
AK	AR	CO	CT	DE	ID	IL	IN	MA	ME
MI	NE	NH	NJ	AL	NM	AZ	NV	DC	NY
FL	OH	GA	OK	KS	OR	KY	PA	MD	CA
RI	MO	HI	SD	MS	IA	UT	NC	MN	WA
SC	MT	WI	TN	ND	WV	TX	VT	NY	ND
VT	WY	VA	LA						

0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Percentage of Students in Grade 8									
AR	CA	CT	DE	GA	IA	ID	IL	MA	MD
ME	MI	MN	MO	AK	NC	CO	NH	HI	NJ
IN	NM	KS	NV	MT	OH	ND	PA	AL	NE
RI	AZ	OK	TN	FL	OR	TX	KY	SD	UT
LA	WI	VA	MS	WV	VT	NY	WY	WA	SC
DC									

Exhibit reads: The percentage of fourth-grade students whose teachers used computers at least once a week to look up mathematics information ranged from less than 10 percent to over 30 percent. The range went from just over 20 percent to over 50 percent for eighth-graders. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 9 presents data on teachers’ use of technology in instructional delivery. It illustrates the percentage of students whose teachers used technology at least once a week to present mathematics concepts in class and the percentage whose teachers used computers at least once a week to post on the web homework, assignments, or schedule information.

Few students had teachers who integrated technology in to curriculum and instruction on a weekly basis in 2004–05 (Exhibit 9). Only about 10 percent of fourth- and eighth-graders were in classrooms where teachers used technology once a week or more often to present mathematics concepts. More eighth-grade students than fourth-grade students had teachers who posted homework and other information on the Web weekly or more often; 32 percent of eighth-grade students and 11 percent of fourth-grade students had teachers who did.

⁸ The state-to-state differences shown in Exhibit 8 are statistically significant. Using a between-groups heterogeneity statistic for each variable and grade, the null hypothesis of equal true values for states was rejected at the alpha = 0.01 level.

Exhibit 9. Percentage of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

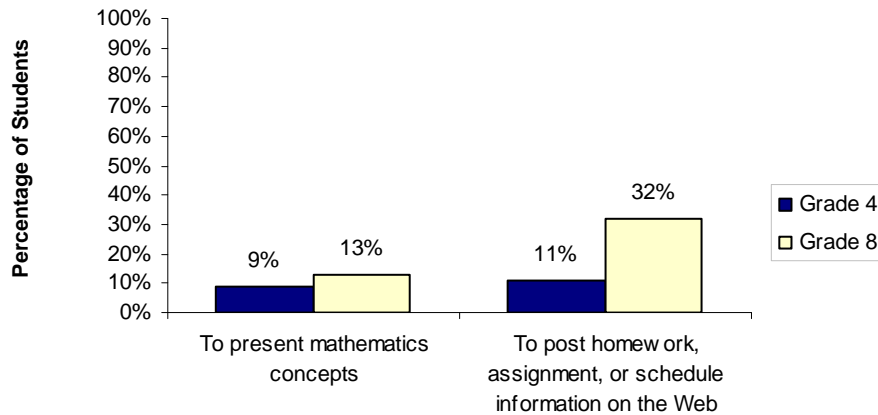


Exhibit reads: The teachers of 9 percent of fourth-graders and 13 percent of eighth-graders used computers at least once a week to present mathematics concepts. The teachers of 11 percent of fourth-graders and 32 percent of eighth-graders used computers at least once a week to post homework, assignment, or schedule information on the Web. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 10 provides state-by-state data on teachers' use of technology in instructional delivery. The data show differences between states in the percentage of students whose teachers used computers at least once a week to present mathematics concepts.

There was as much as a 30 percentage-point difference between states in the proportion of students with teachers who used computers at least weekly to present mathematics concepts in 2004–05 (Exhibit 10). In most states fewer than 10 percent of fourth-grade students had teachers who did.

A substantial number of fourth-grade students used computers at least weekly in mathematics (Exhibit 11). Although few fourth-grade students’ teachers used computers to present mathematics concepts on a weekly basis, 30 percent of fourth-grade students used computers to practice or review mathematics topics and 24 percent used computers to extend mathematics learning through enrichment activities at least once a week. Fewer eighth-grade students used 11 percent computers to practice or review mathematics topics in 2004–05. More eighth-graders (29 percent) used computers for enrichment in mathematics.

Exhibit 11. Percentage of Students Who Used Computers in Mathematics at Least Once a Week in 2004–05

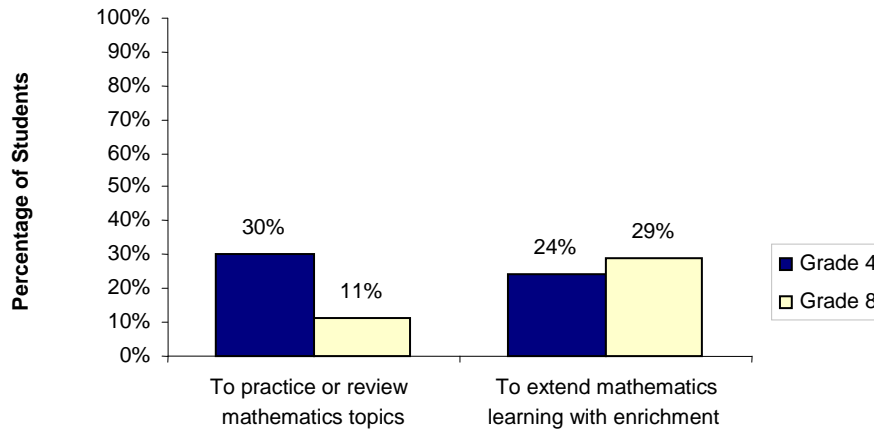


Exhibit reads: Thirty percent of fourth-graders and 11 percent of eighth-graders used computers at least once a week to practice or review mathematics topics. Twenty-four percent of fourth-graders and 29 percent of eighth-graders used computers at least once a week to extend mathematics learning with enrichment activities. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 12 provides state-by-state data on students’ use of technology to practice or review mathematics. It shows differences between states in the frequency with which students used computers for review.

There were large differences between states in the use of computers for mathematics practice or review by fourth-grade students in 2004–05 (Exhibit 12). Six percent of fourth-graders in one state used computers at least weekly to practice or review mathematics topics; in another, almost 70 percent of fourth-grade students did. The range for eighth-grade students is smaller and goes from 1 percent to 29 percent.

Exhibit 13. Percentage of Students Whose Teachers Used Technology to Administer Mathematics Tests in 2004–05

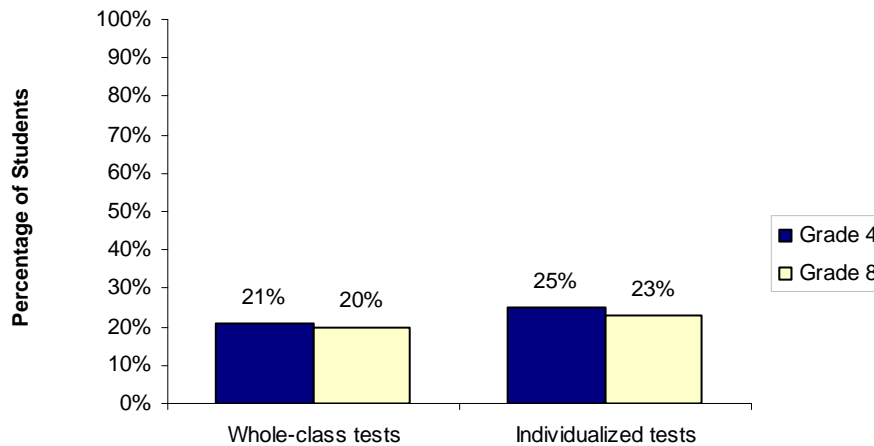


Exhibit reads: The teachers of 21 percent of fourth-graders and 20 percent of eighth-graders used computers to administer whole-class tests in mathematics. The teachers of 25 percent of fourth-graders and 23 percent of eighth-graders used computers to administer individualized tests in mathematics. Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment.

Exhibit 14 and Exhibit 15 show state variability in these practices. Exhibit 14 provides state-by-state data on the use of computers to administer whole-class tests in mathematics, and Exhibit 15 provides the data for individualized tests.

In states where few students' teachers used technology for mathematics testing in 2004–05, fewer than 10 percent of fourth-grade students were in classrooms where either whole-class or individualized tests were administered via computer. In other states, 40 percent or more of students took tests using computers. For whole-class testing, the range for eighth-grade students was slightly smaller. It was similar for individualized testing.

Conclusions

Data from the 2005 NAEP administration show that three-quarters or more of American students were in schools with access to computers. Almost all were in schools with available technical support. However, relatively few students had teachers who used technology to develop mathematics curricula and assignments, present mathematics concepts to their classes, or administer assessments. Only about 10 percent of fourth- and eighth-grade students had teachers who used computers at least weekly to present topics to students. Twenty-five percent of fourth-grade students had teachers who used computers at least weekly to develop curricula in mathematics. The teachers of eighth-grade mathematics students were different: more than 50 percent of eighth-graders had teachers who used technology at least weekly to create mathematics curricula. Twenty percent of fourth- and eighth-graders had teachers who used computers to administer whole-class or individualized tests.

These modest numbers are matched by data on the numbers of students who used technology in their mathematics course work. About 30 percent of students in fourth grade and 11 percent of students in eighth grade used computers at least once a week to extend math learning. Similar numbers of students were in mathematics classrooms that did not make use of computers at all.

Although six states had consistently high levels of teacher and student technology use on the metrics reported here (Alabama, Florida, Georgia, Louisiana, North Carolina, and South Carolina),¹⁴ there were generally large differences between other states in technology use. Differences between states in the frequency with which teachers made use of technology for curriculum development, teaching, and assessment were as large as 40 percentage points.

The 2005 NAEP data do not provide explanations for teachers' and students' limited use of technology in mathematics. Among the possible explanations are perceived limitations in the supply of high-quality relevant content; dated hardware and insufficient support; and the many reasons that it is difficult for teachers to access and profit from teacher professional development. Among these were the difficulty of finding time to take technology-related training, the abbreviated nature of many professional development offerings, insufficient opportunities for immediate and frequent practice of what teachers learn in training, the paucity of follow-up and advanced training on technology use, and the latitude that teachers need to try new and potentially ineffective (at least at first) technologies in their classrooms.

The NAEP data are also insufficient to describe the relationships between classroom technology use and student academic achievement. The NAEP data collections are not designed to measure the impact of educational variables on student performance. Because NAEP data are collected using non-experimental methods, the data cannot support statements about the impact of educational technology on academic achievement.

Next Steps

The next administration of the NAEP mathematics assessment to fourth- and eighth-graders is scheduled for 2007. Fourth- and eighth-grade mathematics teachers will be surveyed about their instructional practices in conjunction with the assessment. Examined together, the 2005 and 2007 data can be used to describe national and statewide trends in the use of educational technology in mathematics classrooms by students and their teachers.

¹⁴ The District of Columbia had consistently high levels of technology use for the eighth-grade metrics only.

CHAPTER 2: INDIVIDUAL STATE PROFILES OF TECHNOLOGY IN MATHEMATICS INSTRUCTION

Alabama: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

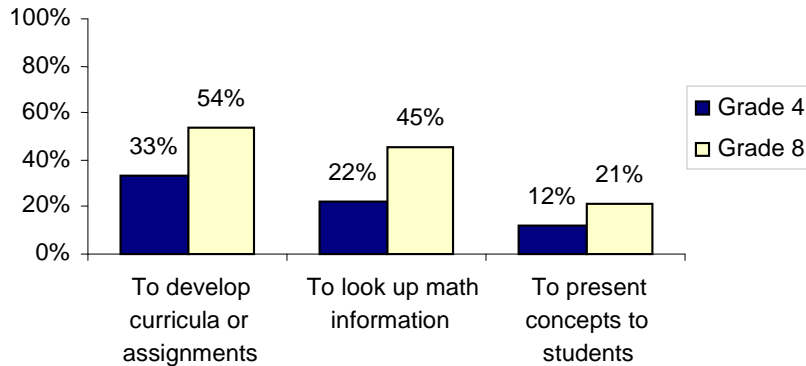


Exhibit reads: In Alabama, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 12 percent to 54 percent for the two grades.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

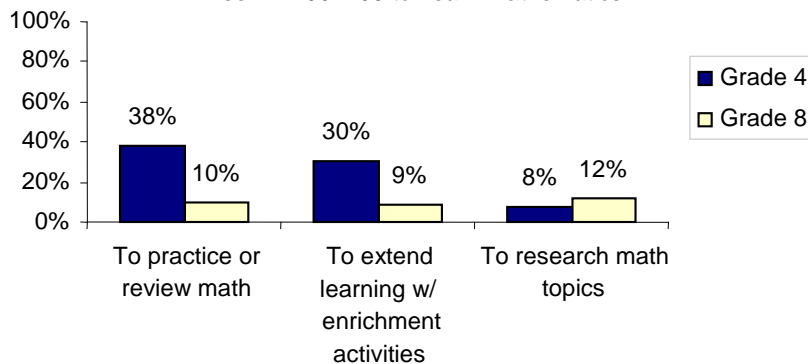


Exhibit reads: In Alabama, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 8 percent to 38 percent for the two grades.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

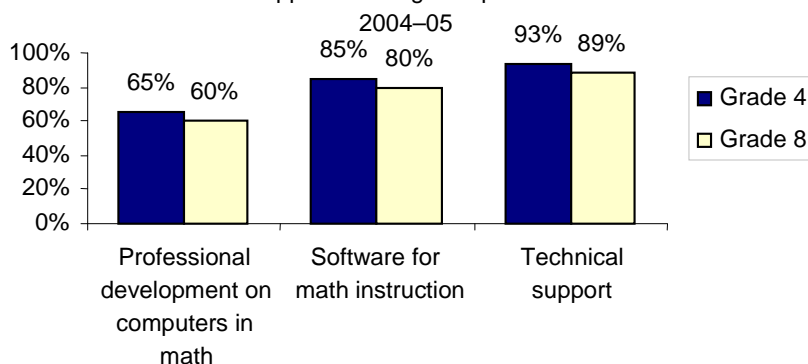


Exhibit reads: In Alabama, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 60 percent to 93 percent.

Alaska: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

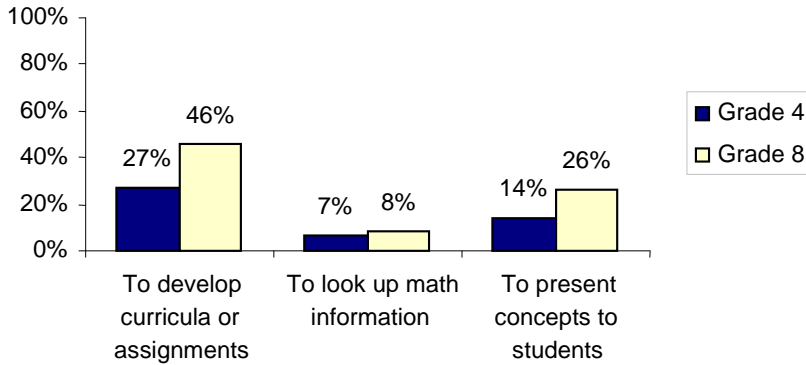


Exhibit reads: In Alaska, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 46 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

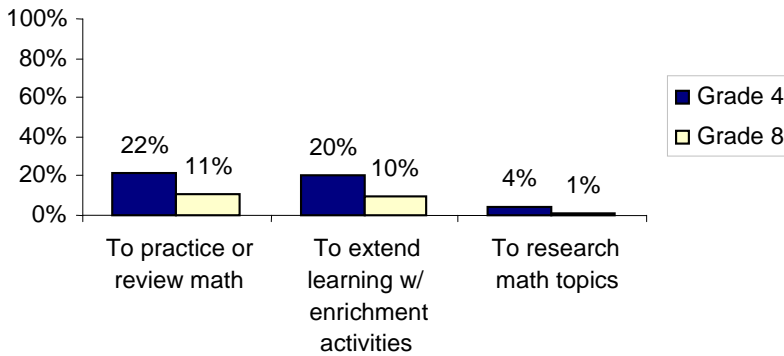


Exhibit reads: In Alaska, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 22 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

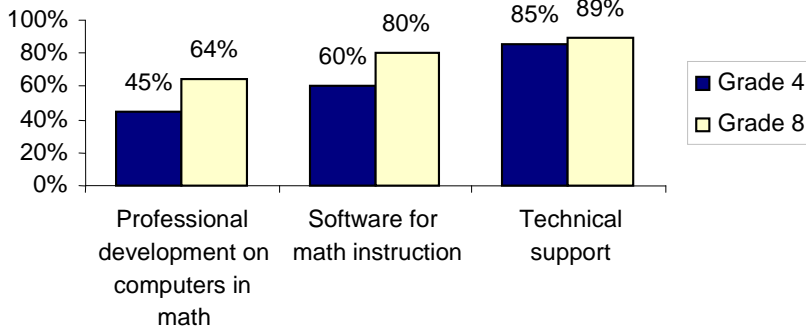


Exhibit reads: In Alaska, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 45 percent to 89 percent.

Arizona: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

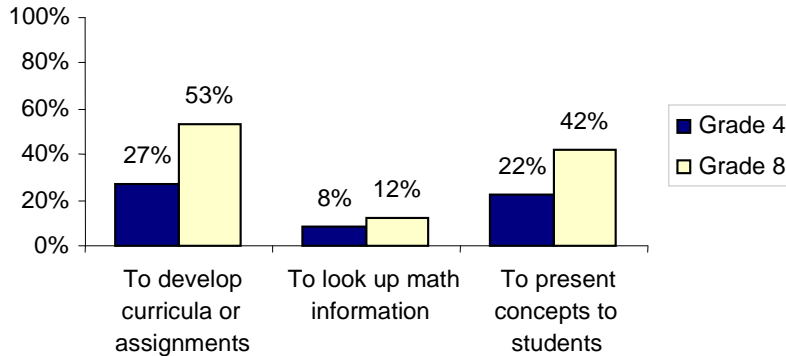


Exhibit reads: In Arizona, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 53 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

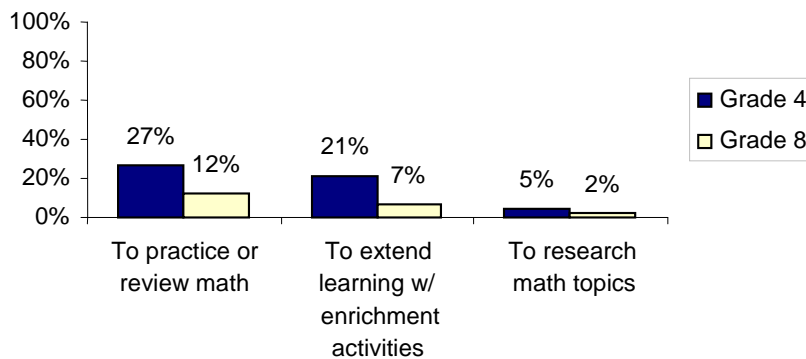


Exhibit reads: In Arizona, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 27 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

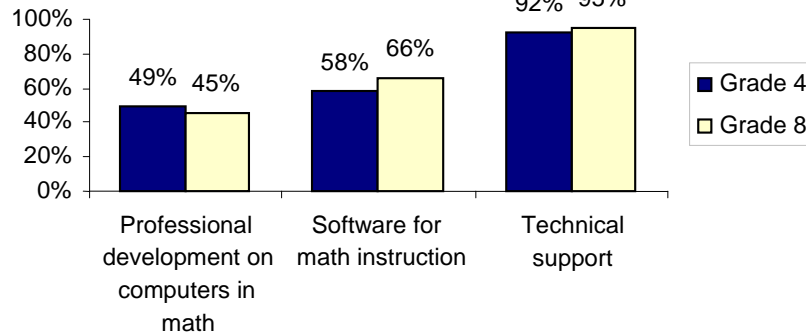


Exhibit reads: In Arizona, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 45 percent to 95 percent.

Arkansas: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

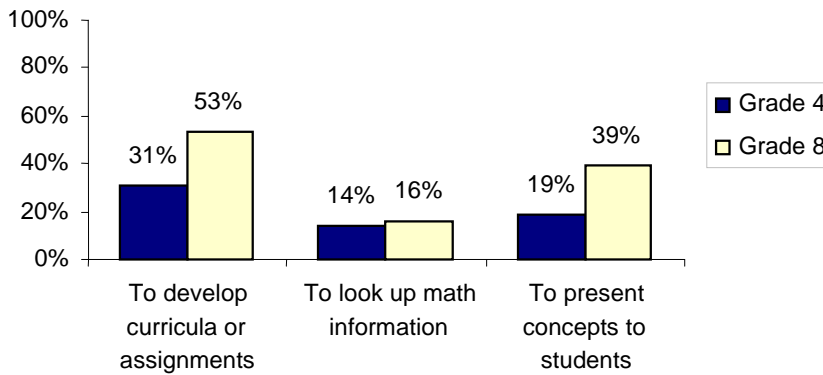


Exhibit reads: In Arkansas, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 14 percent to 53 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

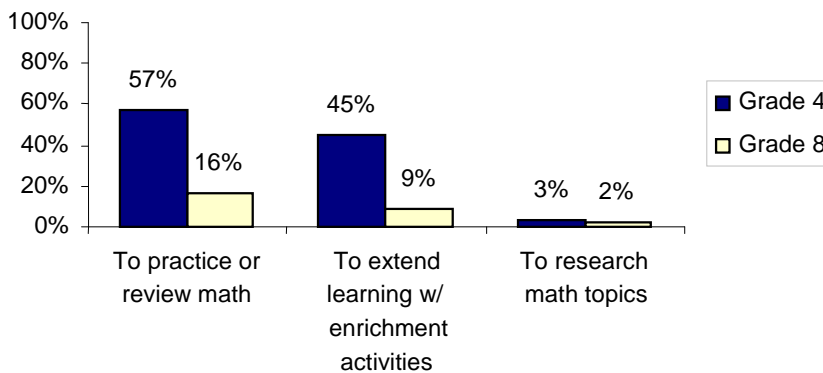


Exhibit reads: In Arkansas, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 57 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

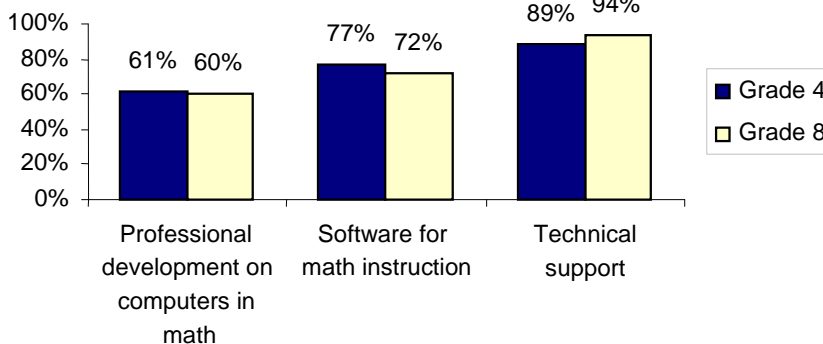


Exhibit reads: In Arkansas, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 60 percent to 94 percent.

California: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

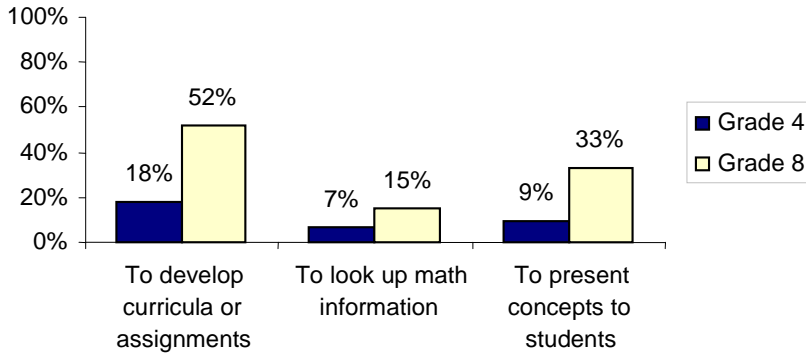


Exhibit reads: In California, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 52 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

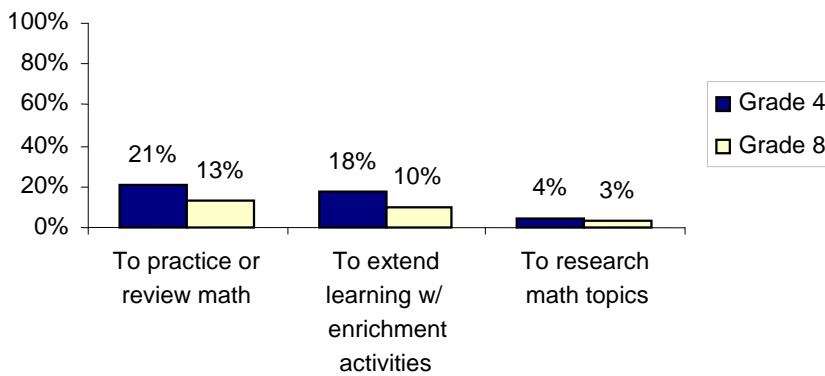


Exhibit reads: In California, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 21 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

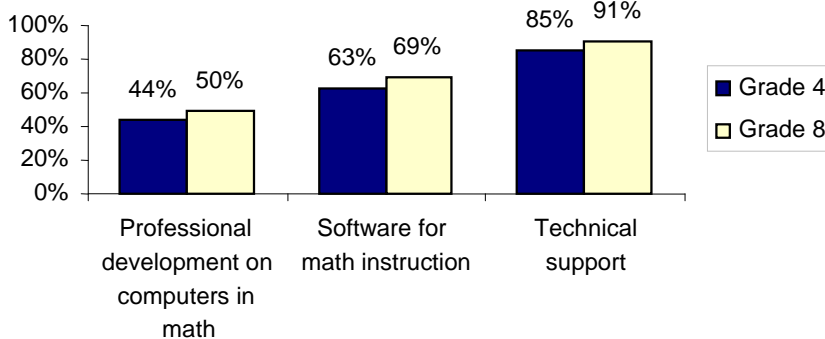


Exhibit reads: In California, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 44 percent to 91 percent.

Colorado: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

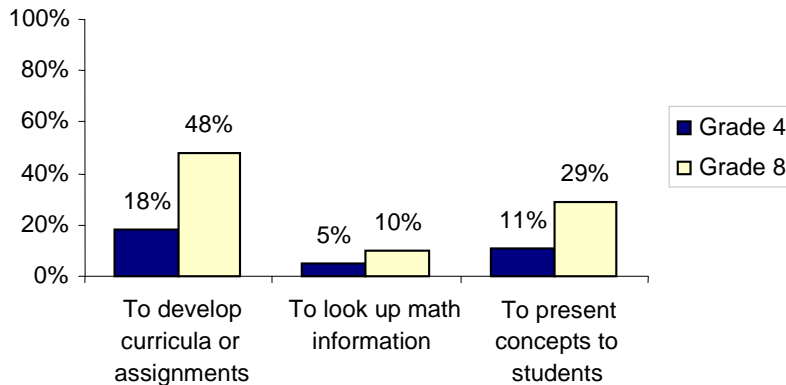


Exhibit reads: In Colorado, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 5 percent to 48 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

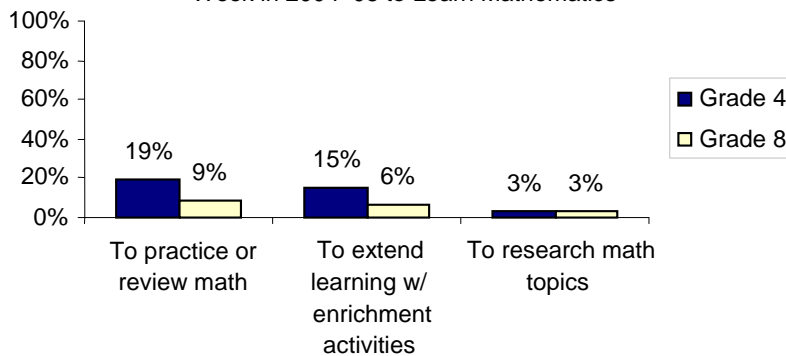


Exhibit reads: In Colorado, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 19 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

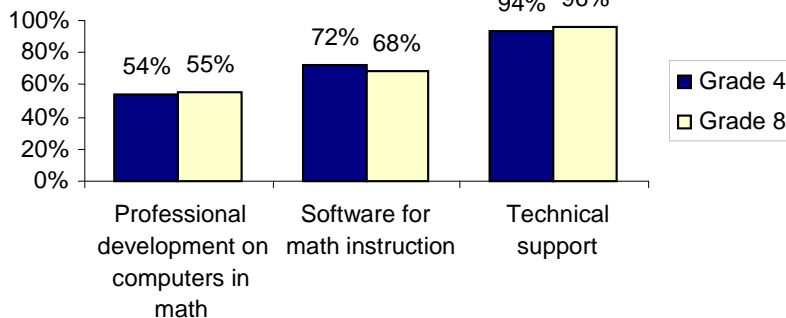


Exhibit reads: In Colorado, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 54 percent to 96 percent.

Connecticut: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

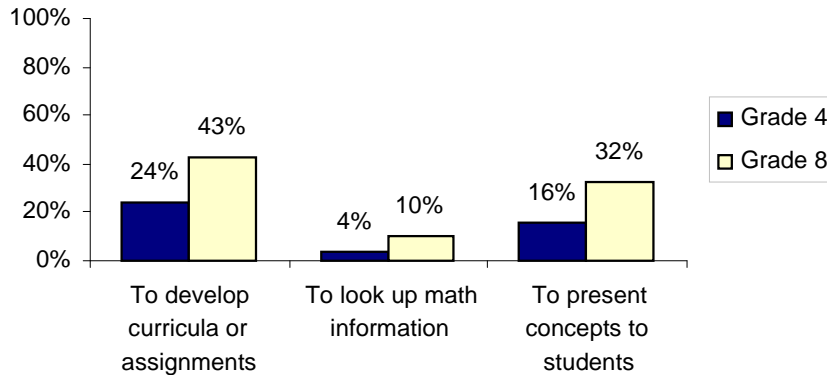


Exhibit reads: In Connecticut, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 43 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

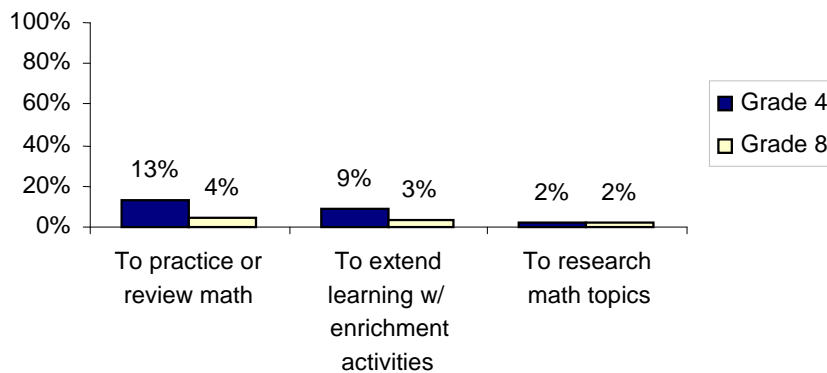


Exhibit reads: In Connecticut, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 13 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

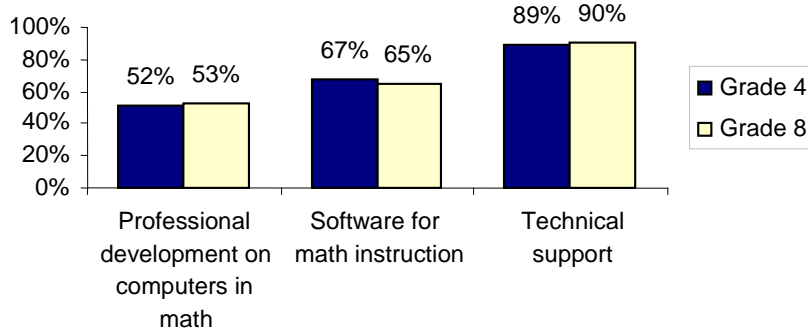


Exhibit reads: In Connecticut, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 52 percent to 90 percent.

Delaware: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

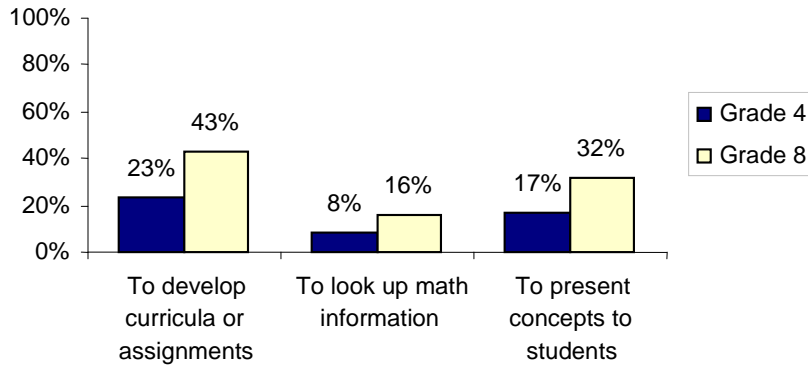


Exhibit reads: In Delaware, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 43 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

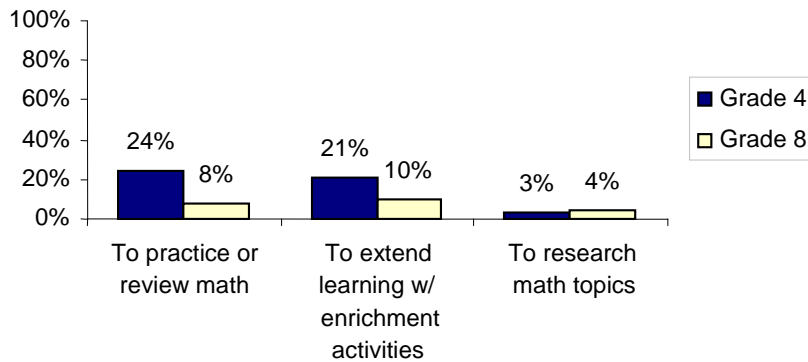


Exhibit reads: In Delaware, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 24 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

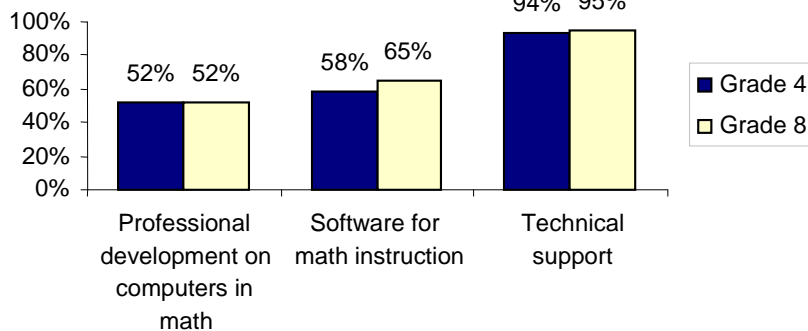


Exhibit reads: In Delaware, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 52 percent to 95 percent.

District of Columbia: Technology for Math Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

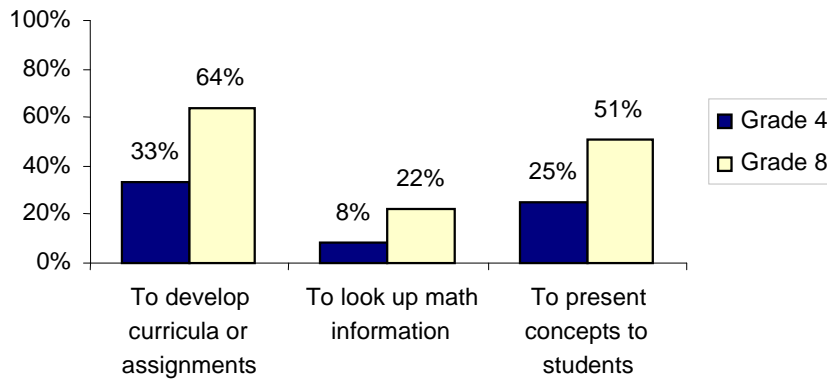


Exhibit reads: In District of Columbia, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 64 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

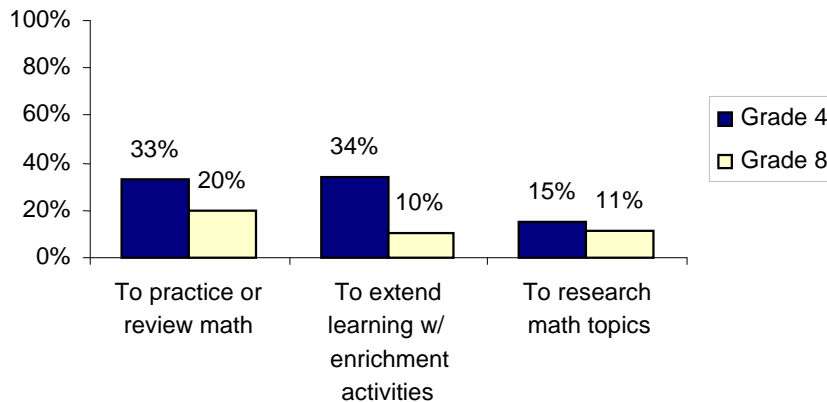


Exhibit reads: In District of Columbia, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 10 percent to 34 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

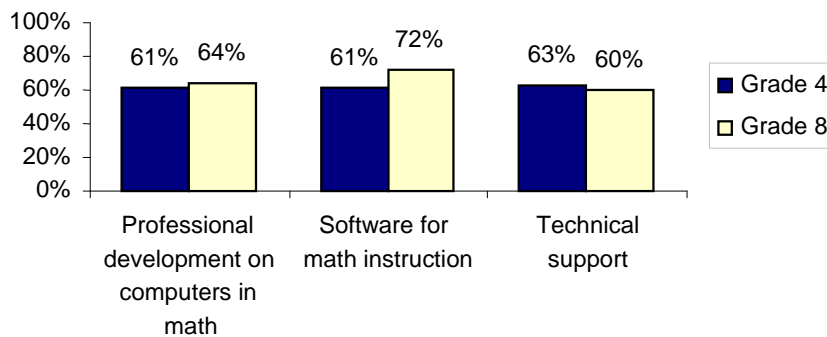


Exhibit reads: In District of Columbia, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 60 percent to 72 percent.

Florida: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

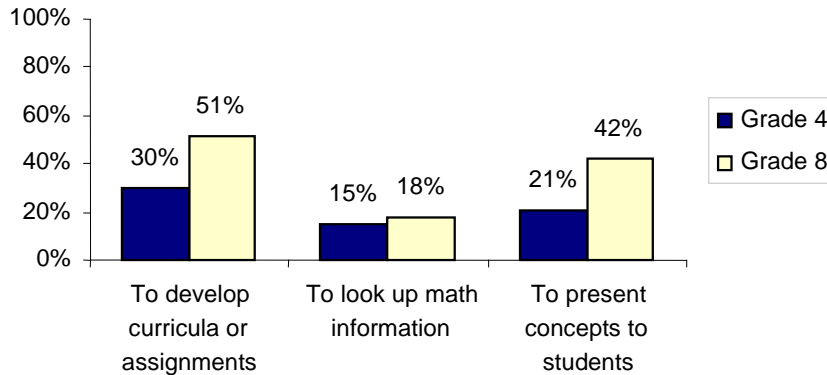


Exhibit reads: In Florida, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 15 percent to 51 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

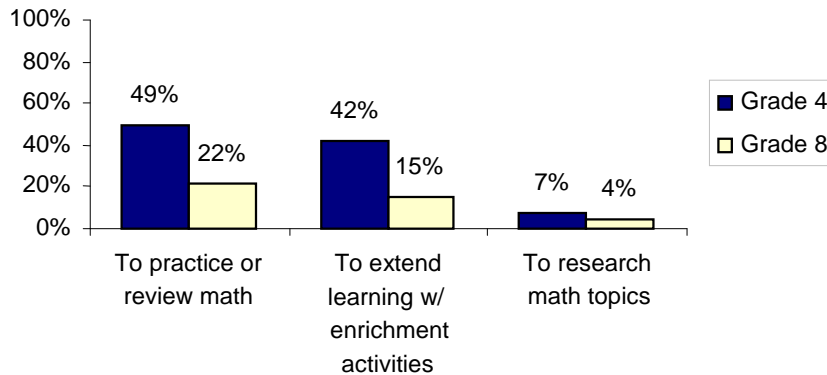


Exhibit reads: In Florida, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 4 percent to 49 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in

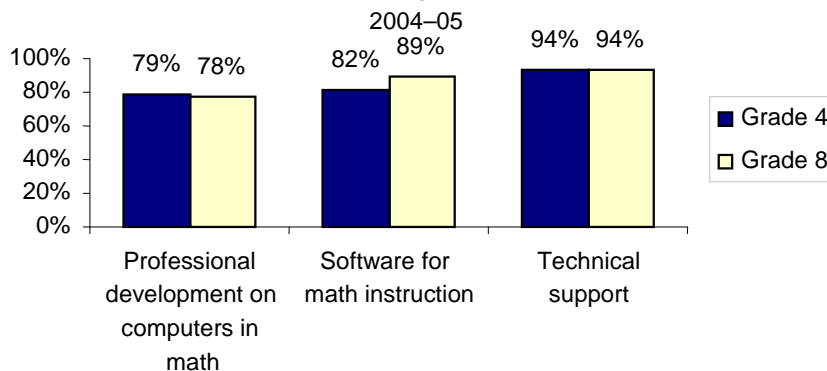


Exhibit reads: In Florida, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 78 percent to 94 percent.

Georgia: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

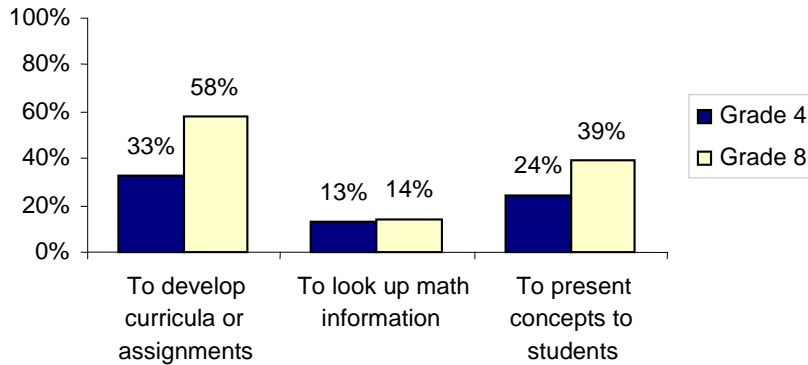


Exhibit reads: In Georgia, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 13 percent to 58 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

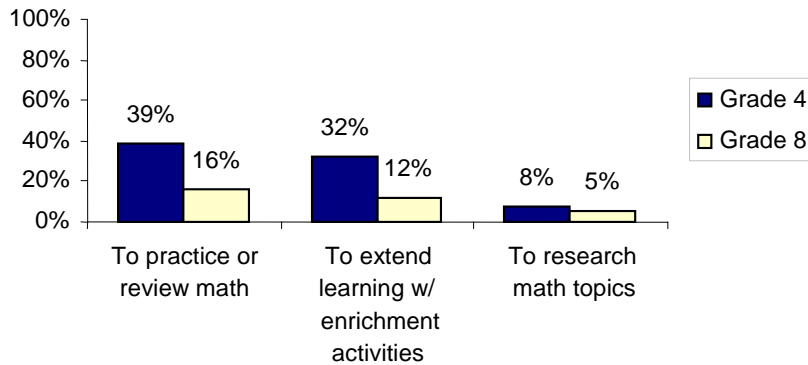


Exhibit reads: In Georgia, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 5 percent to 39 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

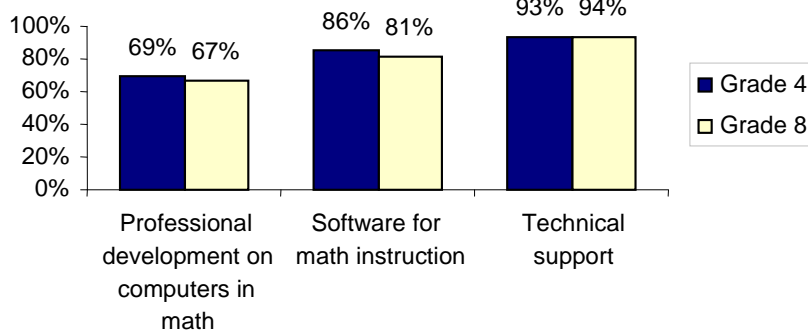


Exhibit reads: In Georgia, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 67 percent to 94 percent.

Hawaii: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

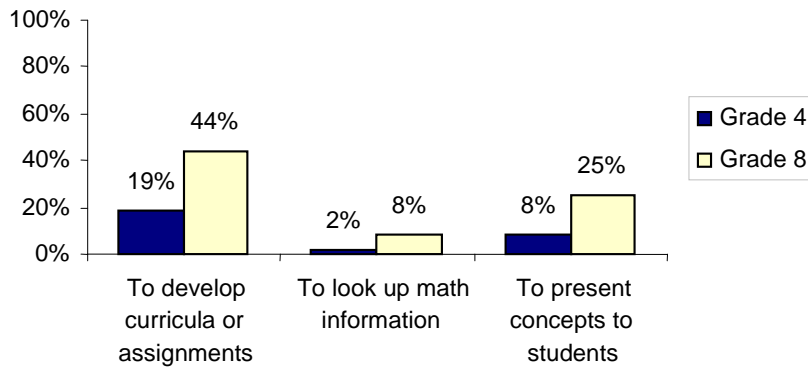


Exhibit reads: In Hawaii, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 2 percent to 44 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

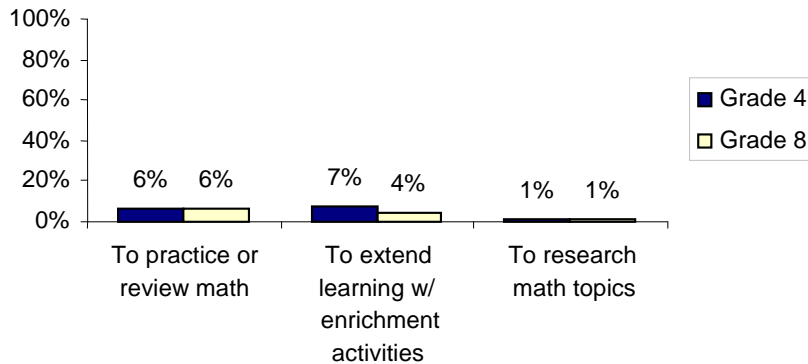


Exhibit reads: In Hawaii, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 7 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

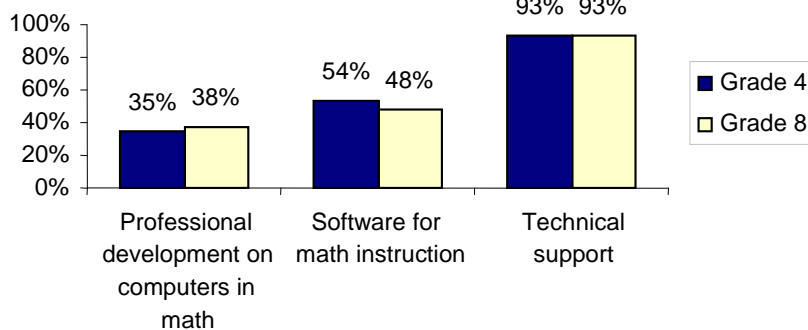


Exhibit reads: In Hawaii, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 35 percent to 93 percent.

Idaho: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

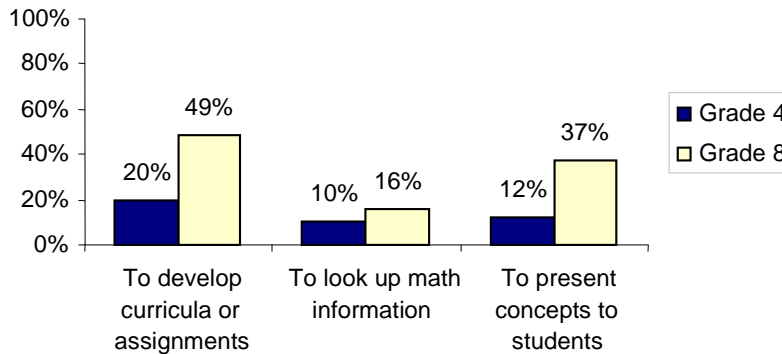


Exhibit reads: In Idaho, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 49 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

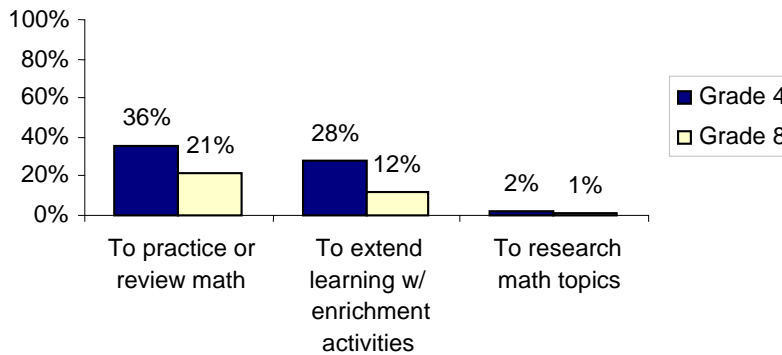


Exhibit reads: In Idaho, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 36 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points) except in using computers to practice or review math. Thirteen percent of students in their teachers' most advanced classes used computers to practice or review math.

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

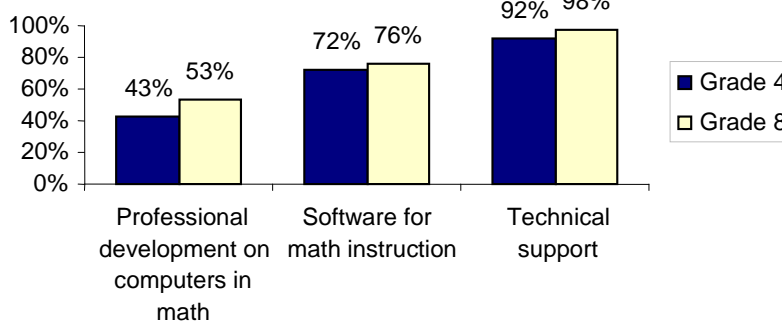


Exhibit reads: In Idaho, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 43 percent to 98 percent.

Illinois: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

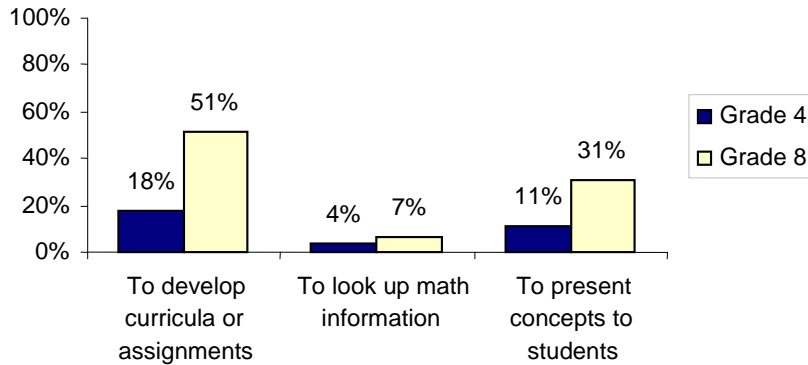


Exhibit reads: In Illinois, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 51 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

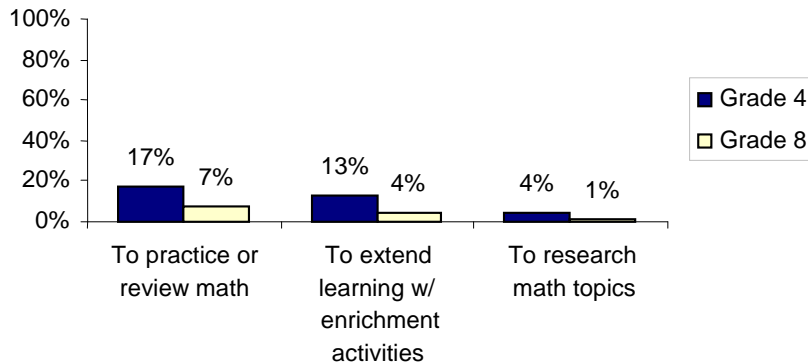


Exhibit reads: In Illinois, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 17 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

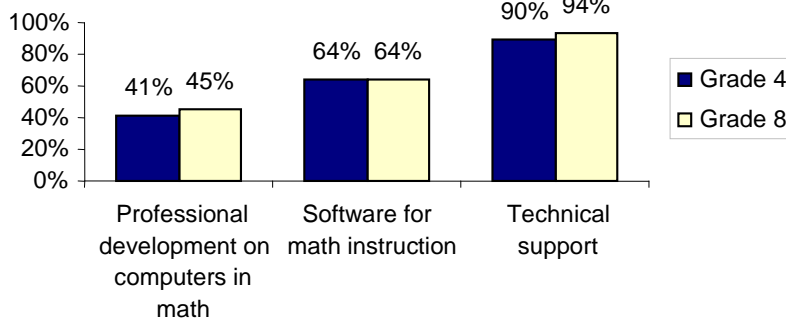


Exhibit reads: In Illinois, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 41 percent to 94 percent.

Indiana: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

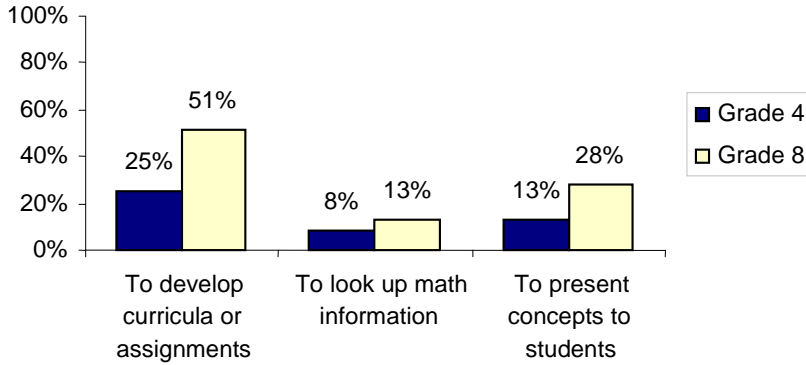


Exhibit reads: In Indiana, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 51 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

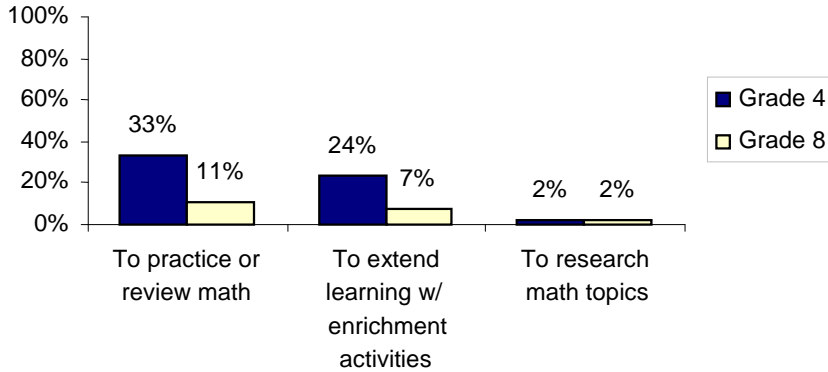


Exhibit reads: In Indiana, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 33 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

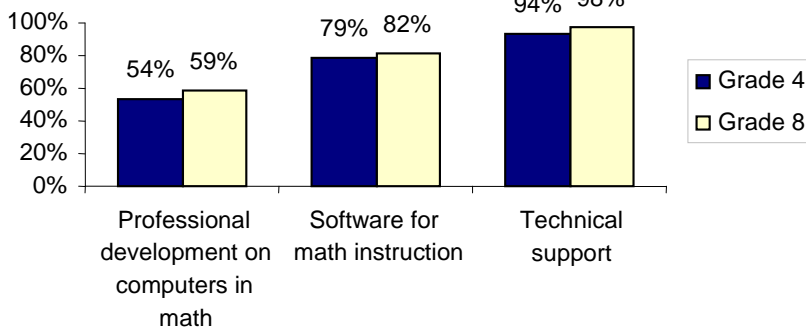


Exhibit reads: In Indiana, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 54 percent to 98 percent.

Iowa: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

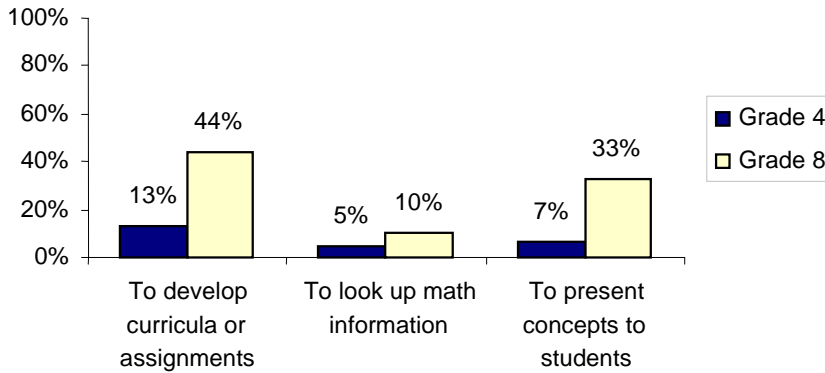


Exhibit reads: In Iowa, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 5 percent to 44 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

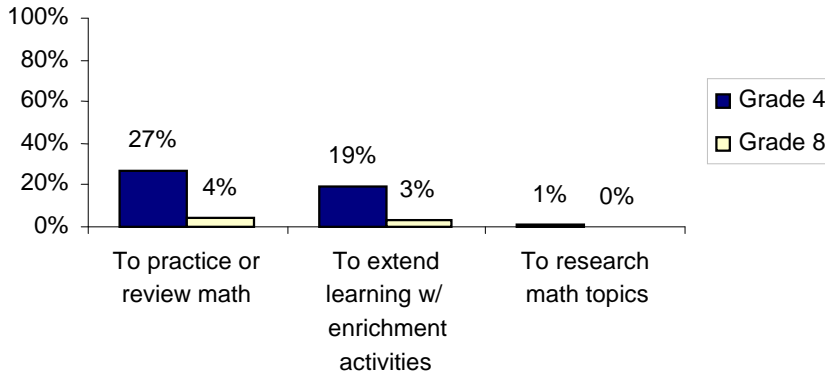


Exhibit reads: In Iowa, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 27 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

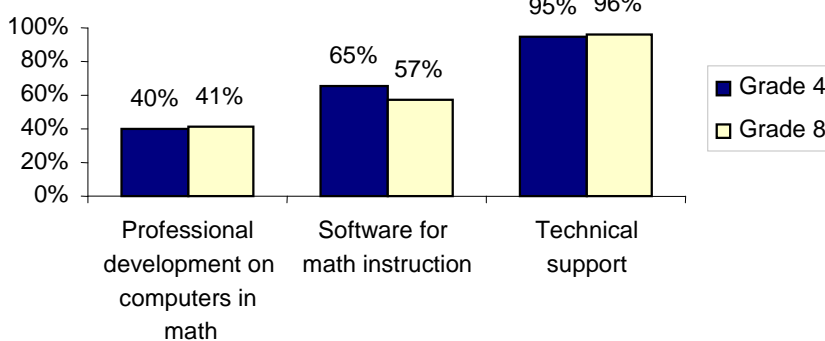


Exhibit reads: In Iowa, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 40 percent to 96 percent.

Kansas: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

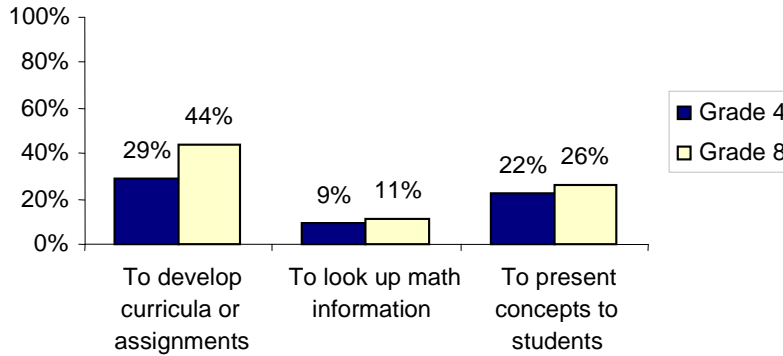


Exhibit reads: In Kansas, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 9 percent to 44 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

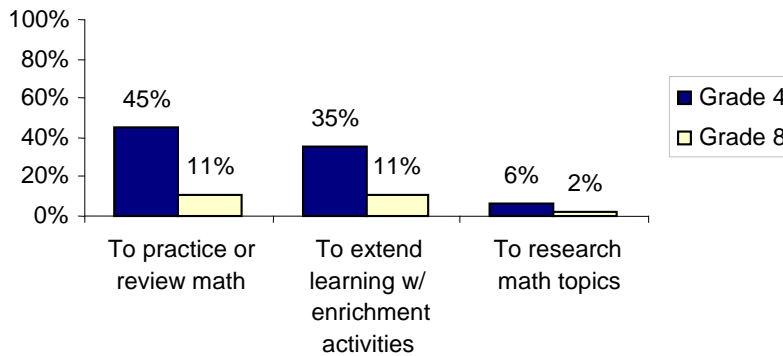


Exhibit reads: In Kansas, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 45 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

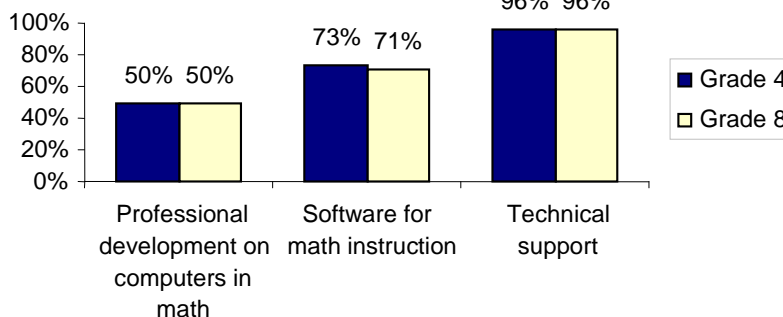


Exhibit reads: In Kansas, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 50 percent to 96 percent.

Kentucky: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

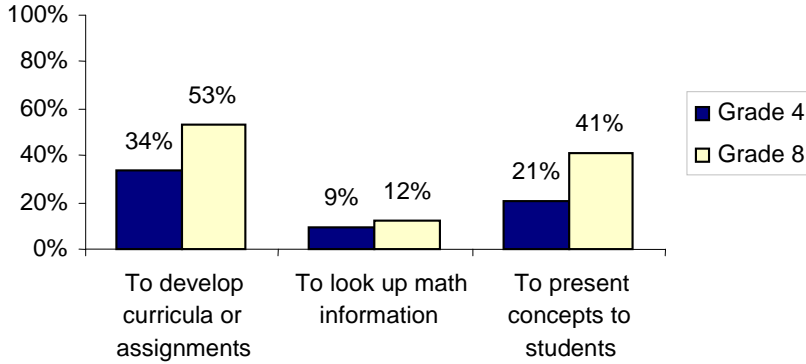


Exhibit reads: In Kentucky, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 9 percent to 53 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

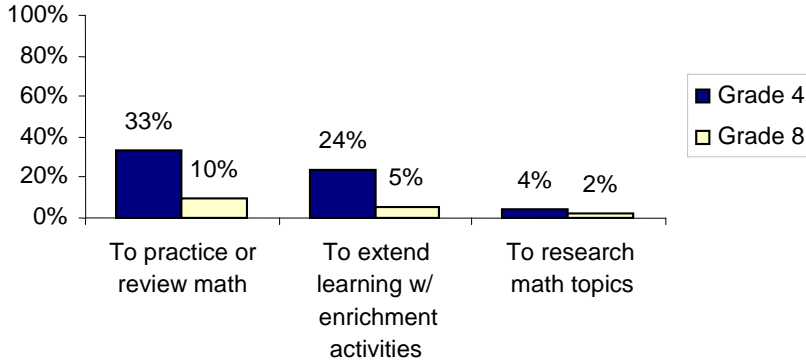


Exhibit reads: In Kentucky, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 33 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

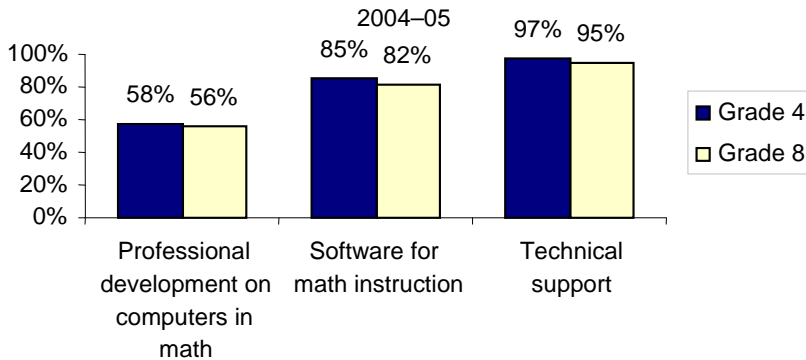


Exhibit reads: In Kentucky, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 56 percent to 97 percent.

Louisiana: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

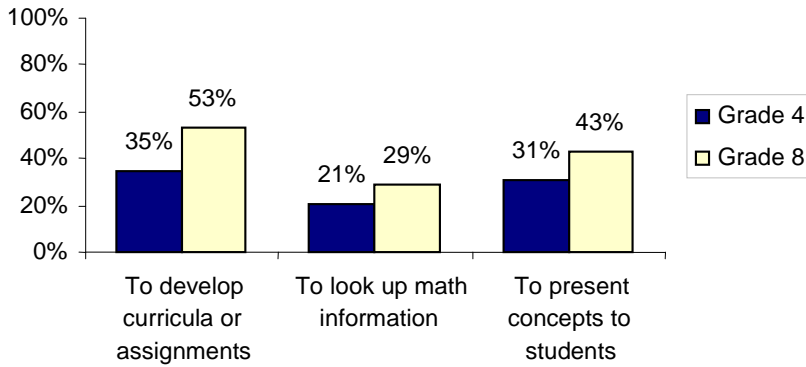


Exhibit reads: In Louisiana, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 21 percent to 53 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

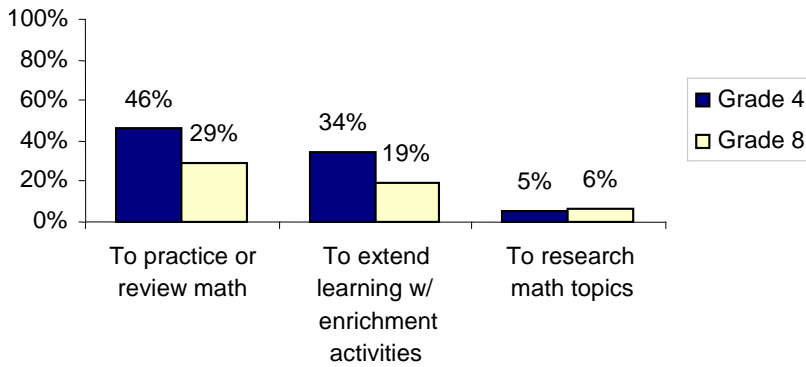


Exhibit reads: In Louisiana, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 5 percent to 46 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

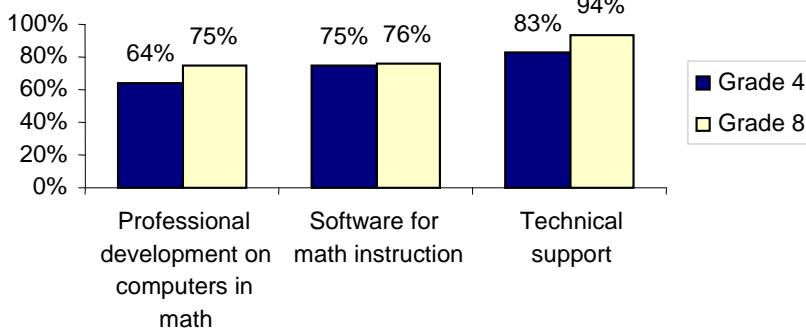


Exhibit reads: In Louisiana, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 64 percent to 94 percent.

Maine: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

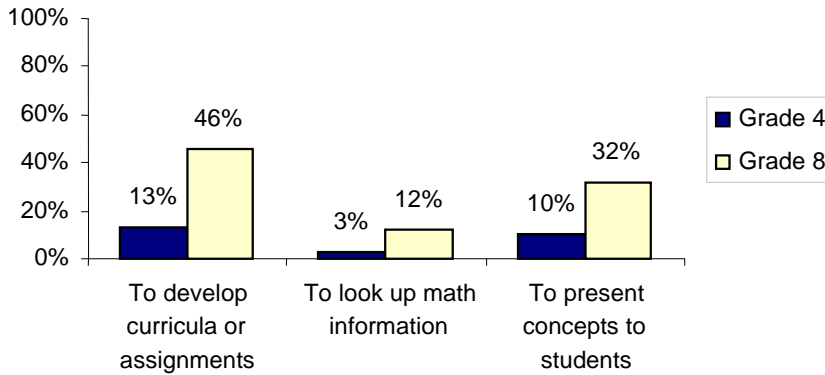


Exhibit reads: In Maine, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 3 percent to 46 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

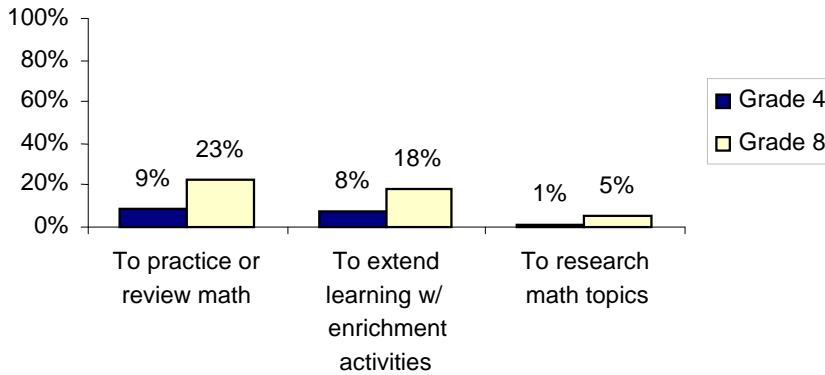


Exhibit reads: In Maine, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 23 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

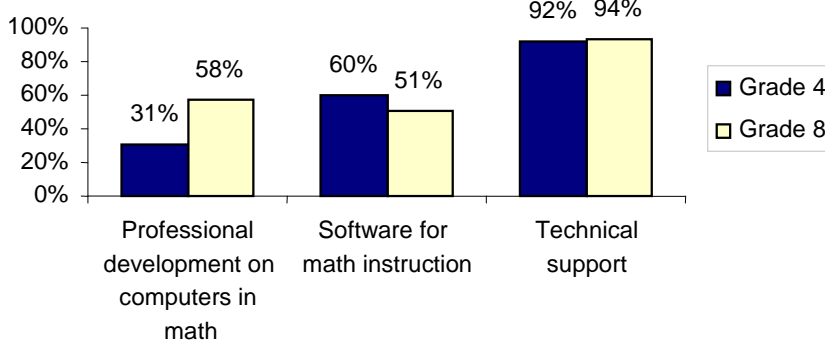


Exhibit reads: In Maine, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 31 percent to 94 percent.

Maryland: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

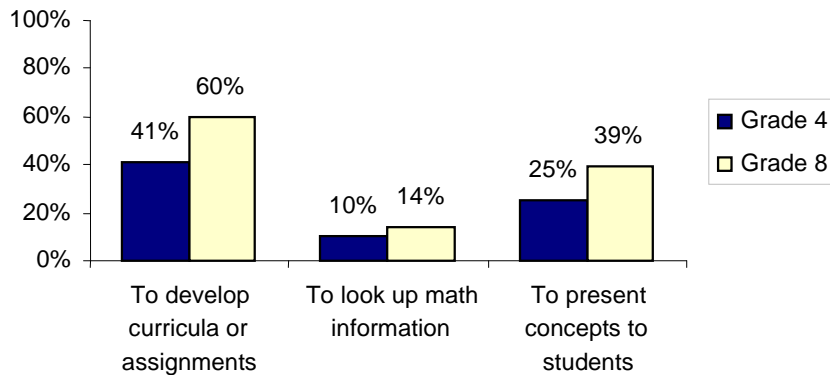


Exhibit reads: In Maryland, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 60 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

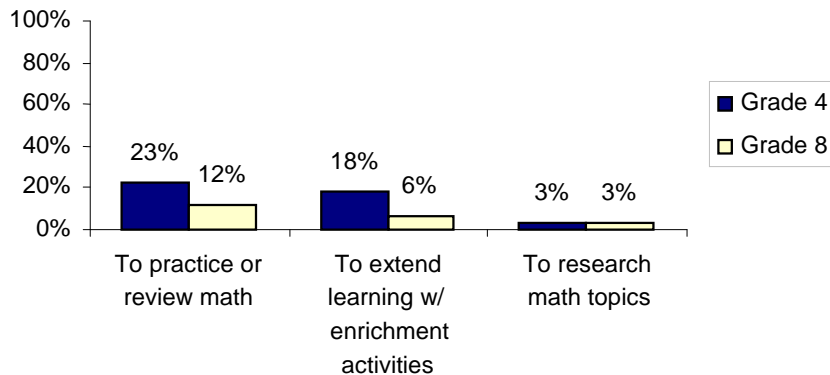


Exhibit reads: In Maryland, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 23 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

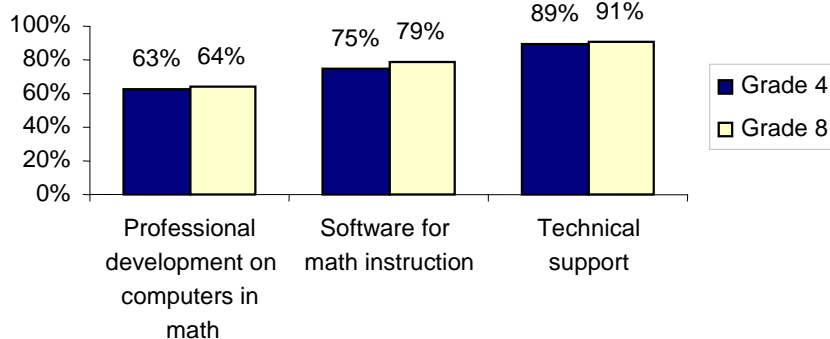


Exhibit reads: In Maryland, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 63 percent to 91 percent.

Massachusetts: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

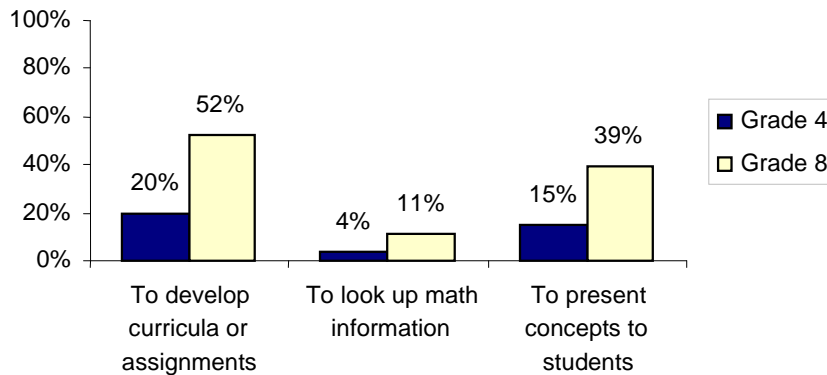


Exhibit reads: In Massachusetts, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 52 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

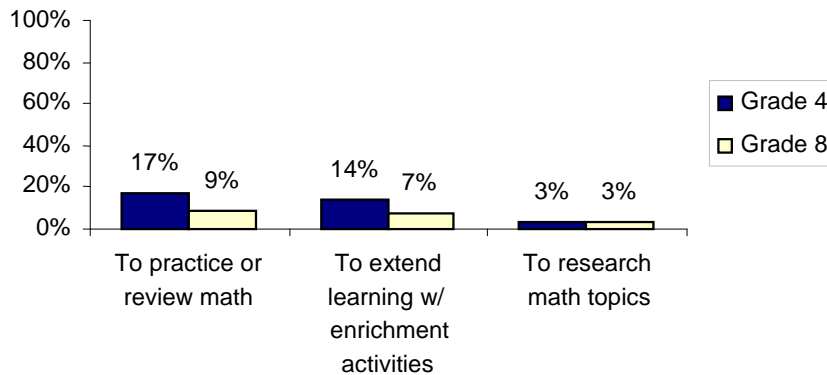


Exhibit reads: In Massachusetts, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 17 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

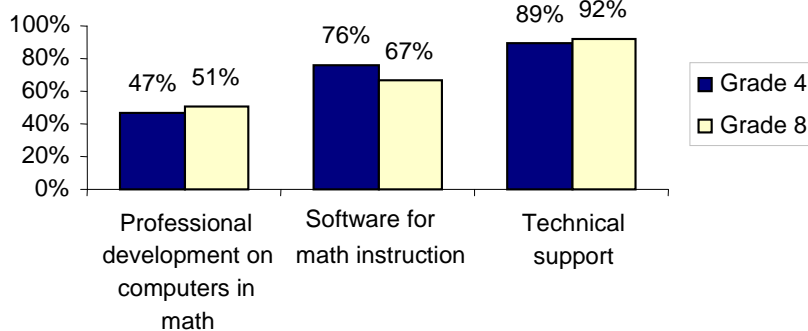


Exhibit reads: In Massachusetts, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 47 percent to 92 percent.

Michigan: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

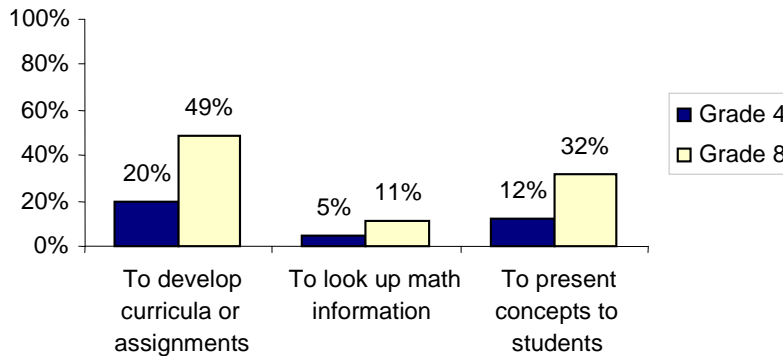


Exhibit reads: In Michigan, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 5 percent to 49 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

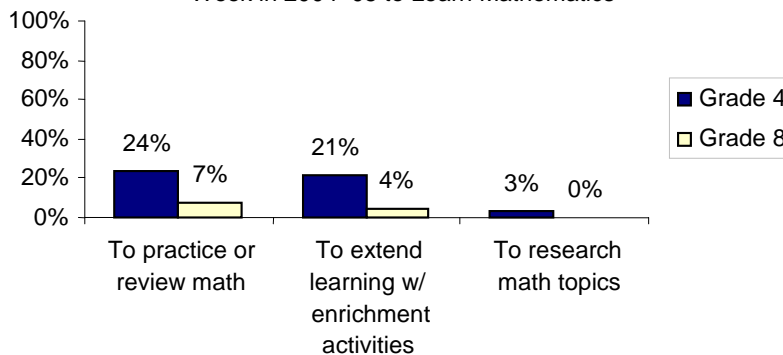


Exhibit reads: In Michigan, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 24 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

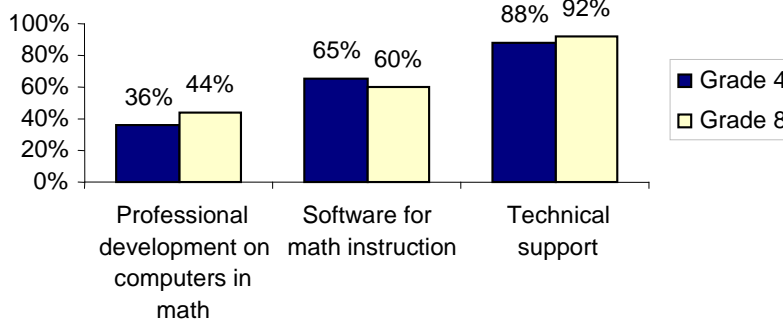


Exhibit reads: In Michigan, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 36 percent to 92 percent.

Minnesota: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

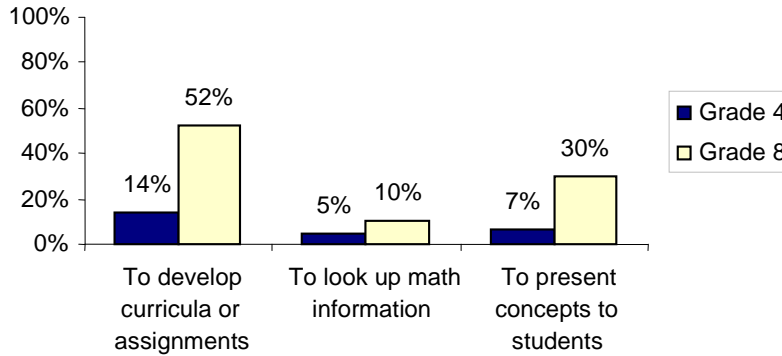


Exhibit reads: In Minnesota, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 5 percent to 52 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

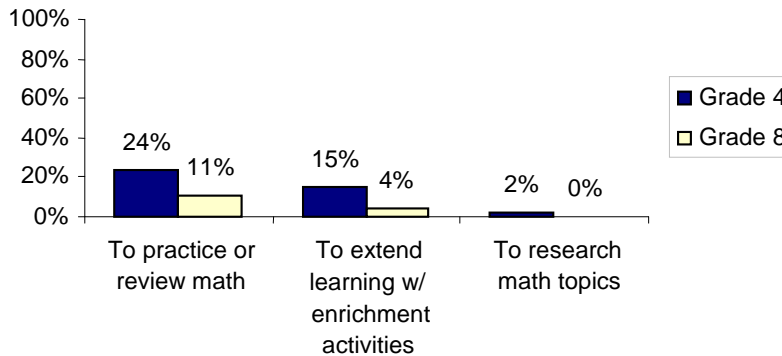


Exhibit reads: In Minnesota, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 24 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

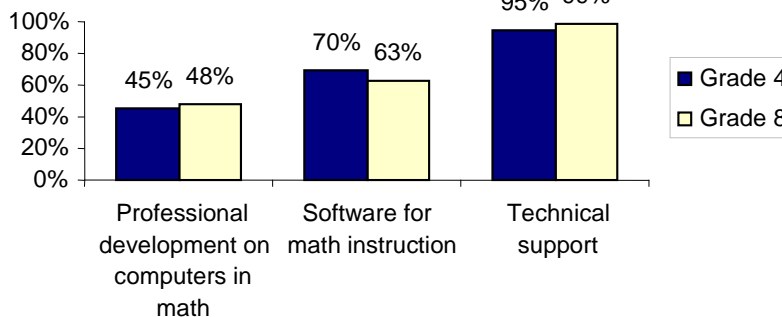


Exhibit reads: In Minnesota, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 45 percent to 99 percent.

Mississippi: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

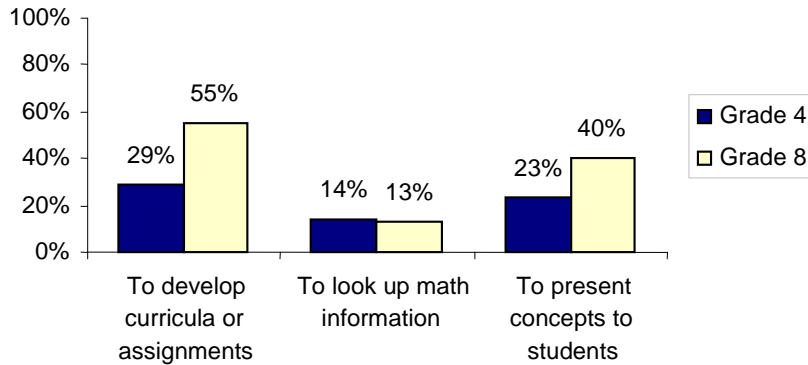


Exhibit reads: In Mississippi, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 13 percent to 55 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

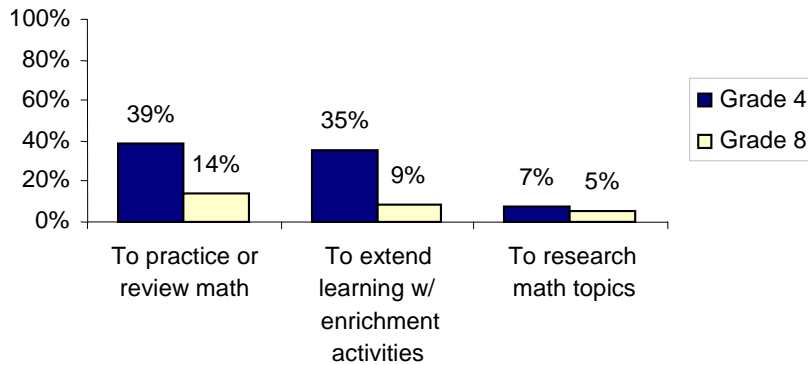


Exhibit reads: In Mississippi, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 5 percent to 39 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

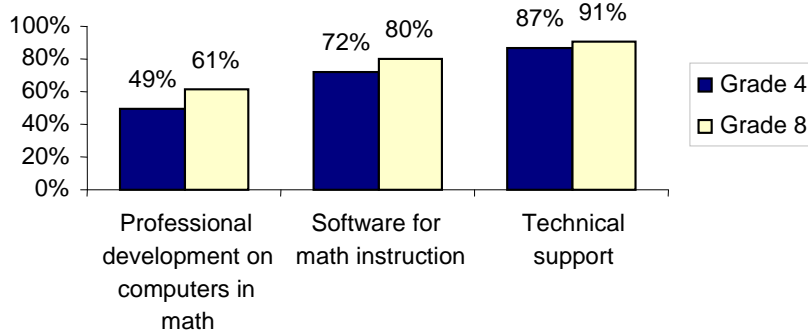


Exhibit reads: In Mississippi, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 49 percent to 91 percent.

Missouri: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

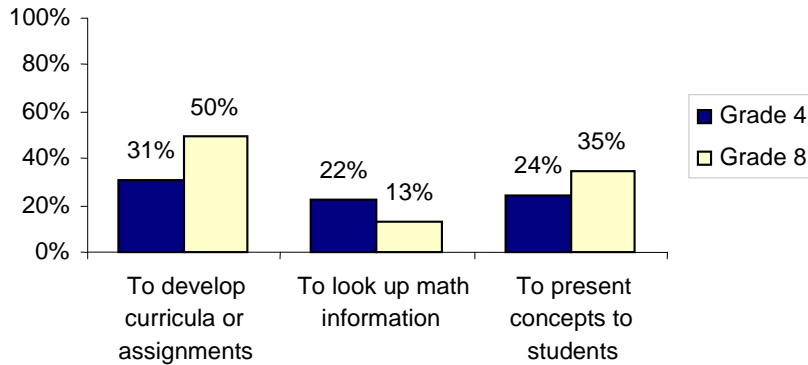


Exhibit reads: In Missouri, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 13 percent to 50 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

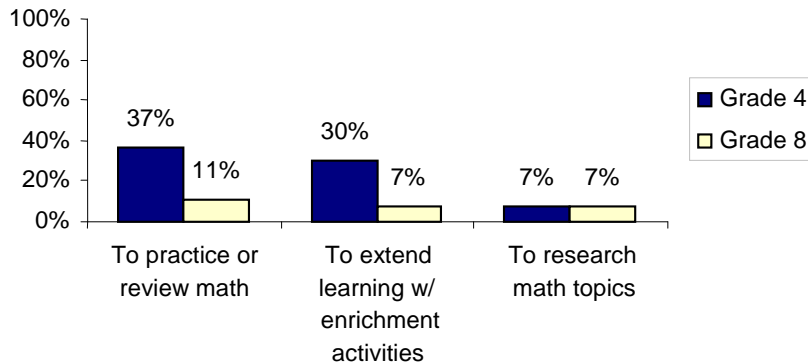


Exhibit reads: In Missouri, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 7 percent to 37 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

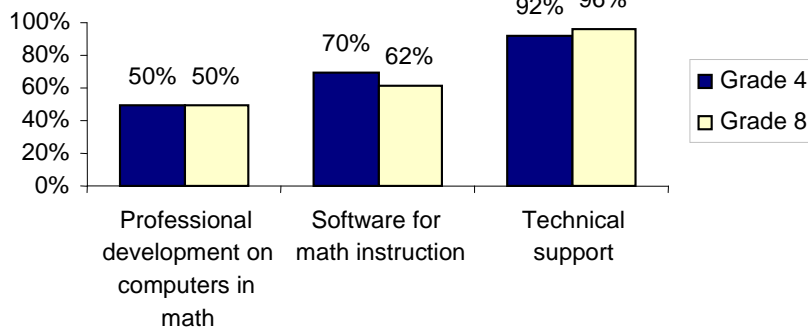


Exhibit reads: In Missouri, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 50 percent to 96 percent.

Montana: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

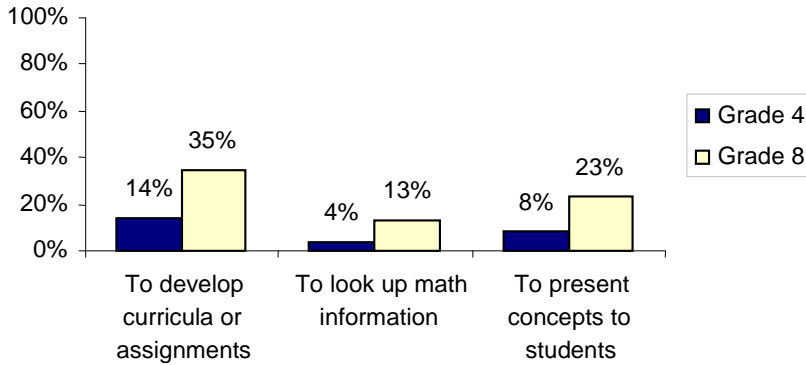


Exhibit reads: In Montana, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 35 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

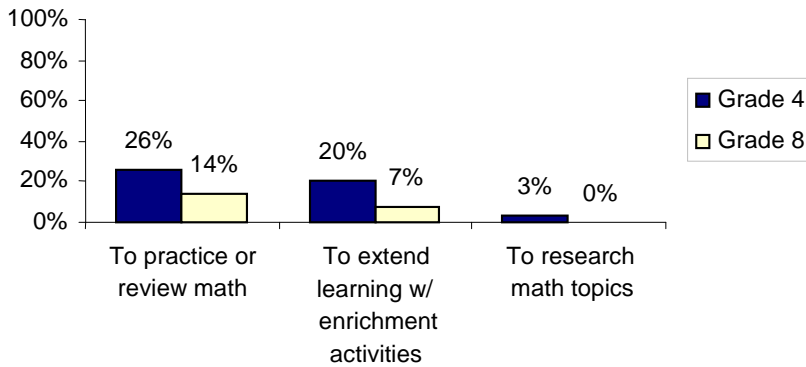


Exhibit reads: In Montana, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 26 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

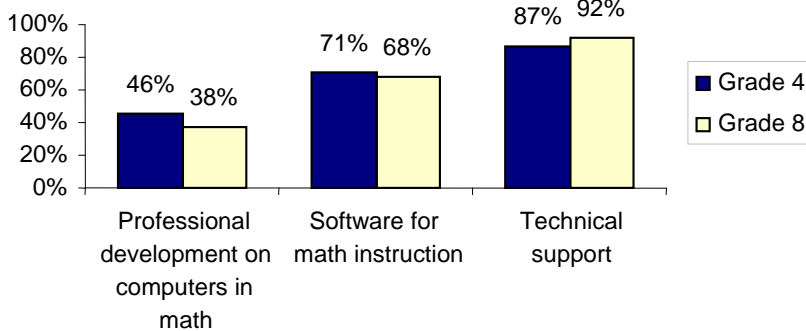


Exhibit reads: In Montana, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 38 percent to 92 percent.

Nebraska: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

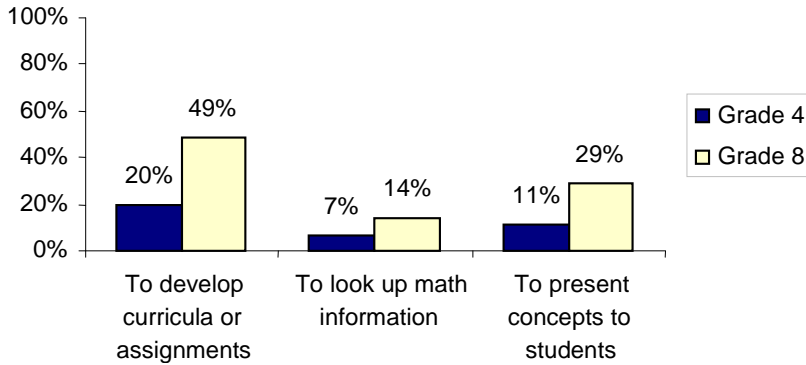


Exhibit reads: In Nebraska, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 49 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

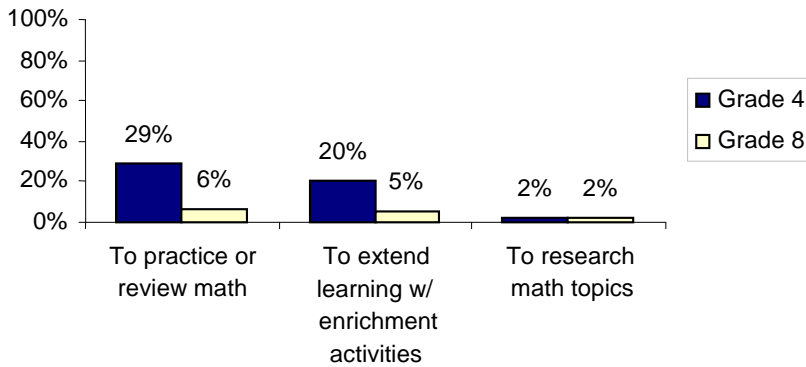


Exhibit reads: In Nebraska, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 29 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

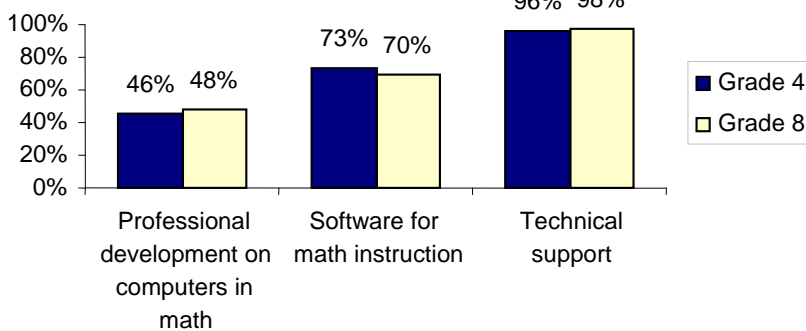


Exhibit reads: In Nebraska, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 46 percent to 98 percent.

Nevada: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

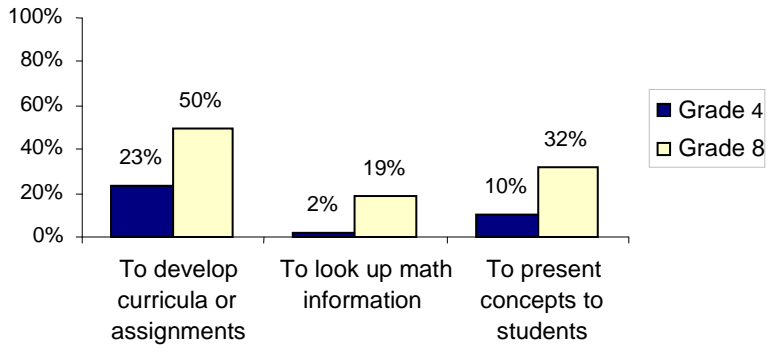


Exhibit reads: In Nevada, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 2 percent to 50 percent for the two grades and three different activities

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

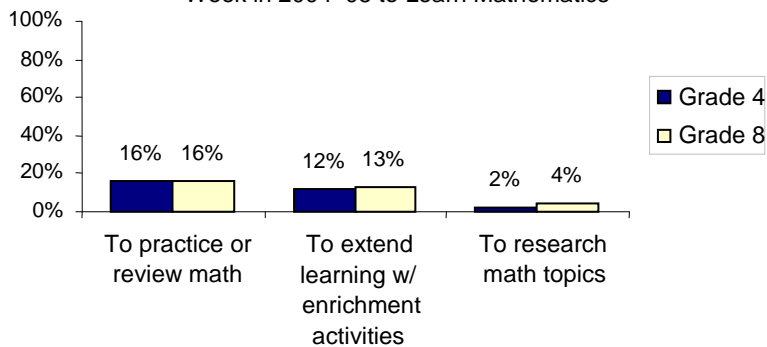


Exhibit reads: In Nevada, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 16 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points) for computer use in researching math topics. Nine percent of students in their teachers' most advanced classes used computers to practice or review math. Seven percent of students in their teachers' most advanced classes used computers to extend math learning with enrichment activities.

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

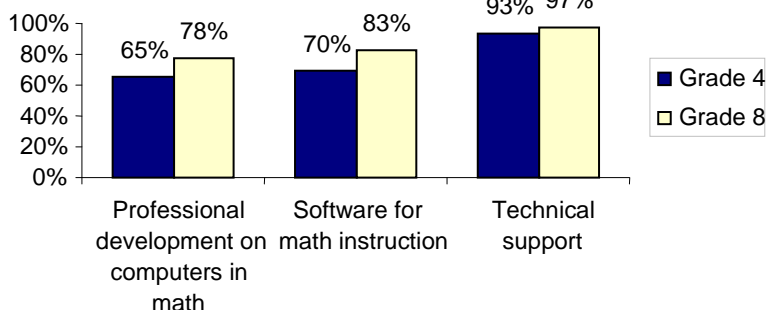


Exhibit reads: In Nevada, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 65 percent to 97 percent.

New Hampshire: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

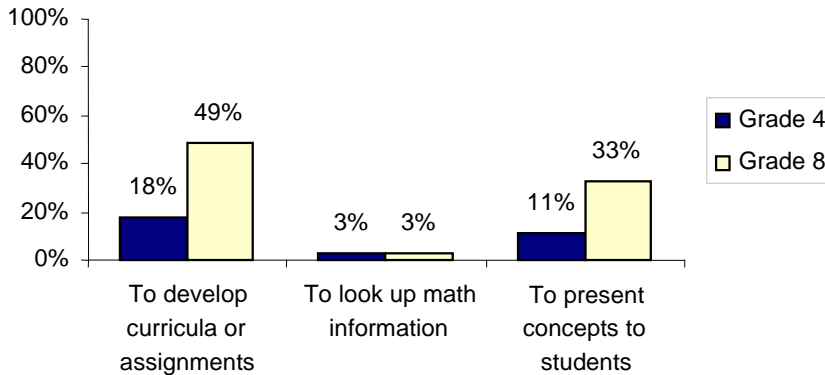


Exhibit reads: In New Hampshire, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 3 percent to 49 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

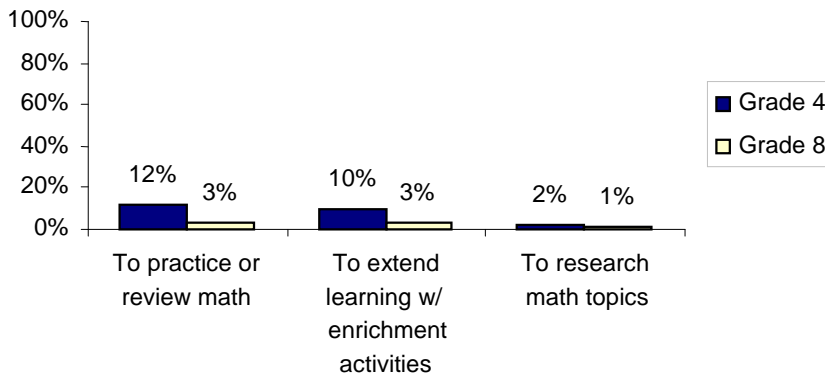


Exhibit reads: In New Hampshire, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 12 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

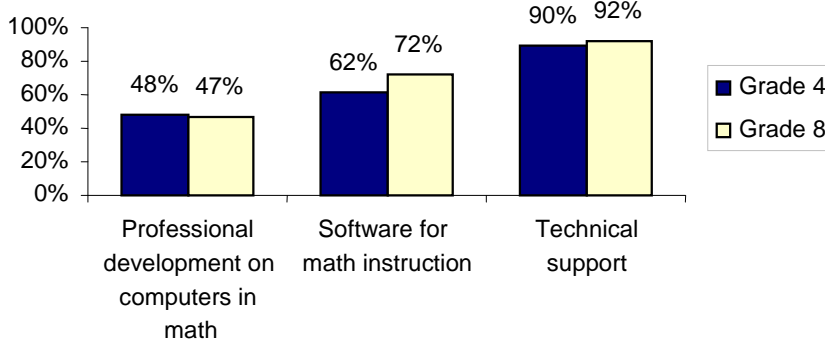


Exhibit reads: In New Hampshire, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 47 percent to 92 percent.

New Jersey: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

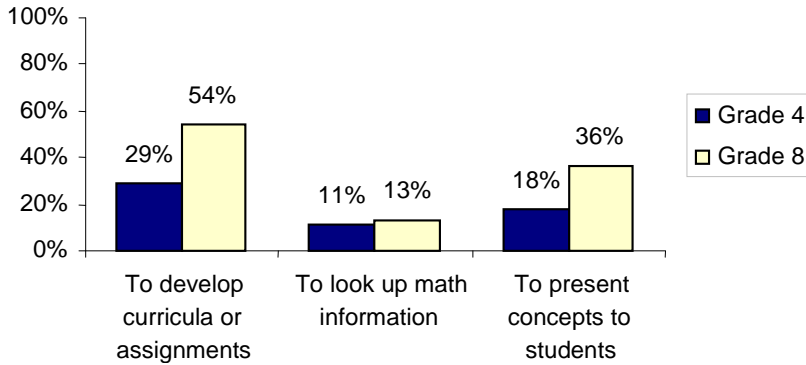


Exhibit reads: In New Jersey, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 11 percent to 54 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

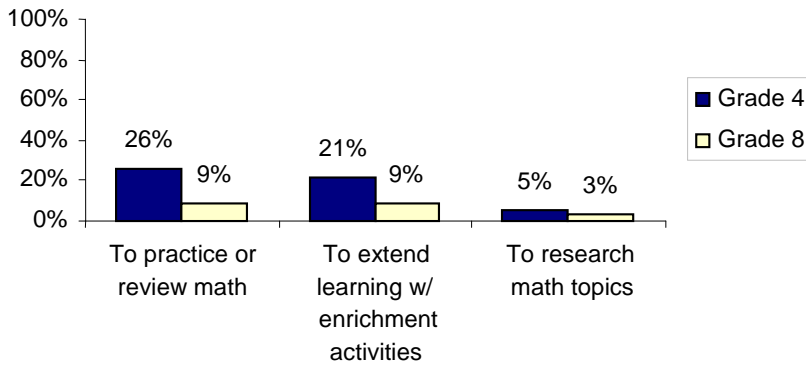


Exhibit reads: In New Jersey, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 26 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

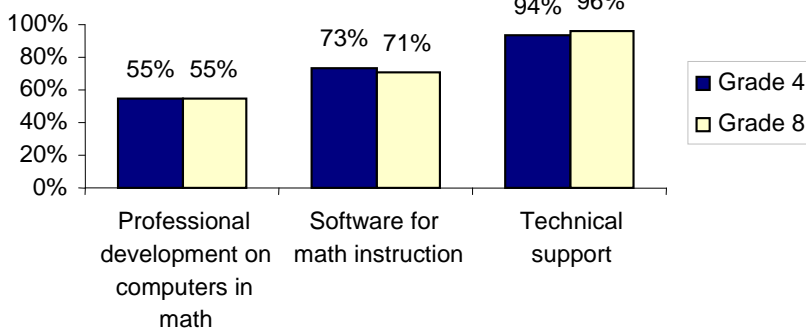


Exhibit reads: In New Jersey, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 55 percent to 96 percent.

New Mexico: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

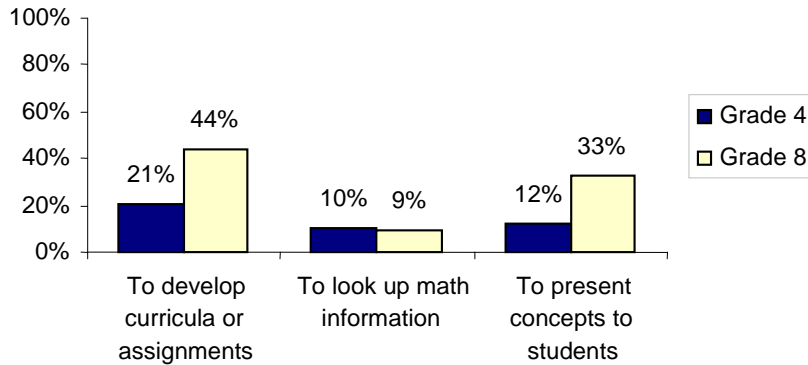


Exhibit reads: In New Mexico, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 9 percent to 44 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

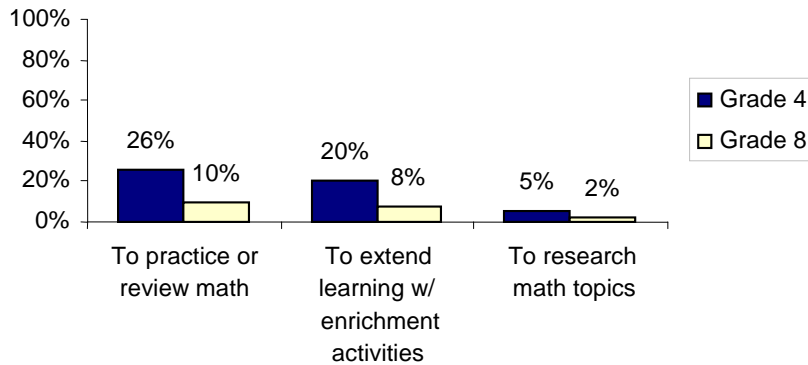


Exhibit reads: In New Mexico, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 26 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

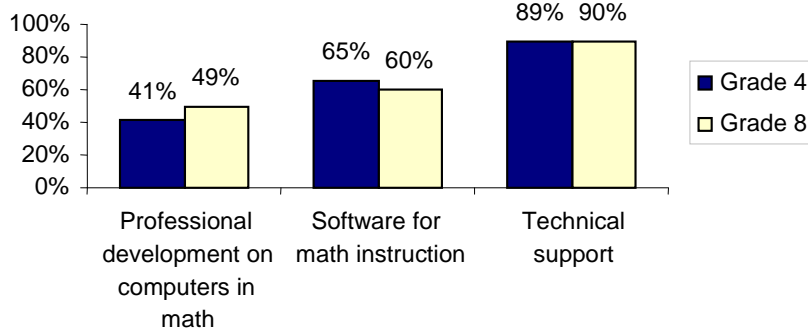


Exhibit reads: In New Mexico, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 41 percent to 90 percent.

New York: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

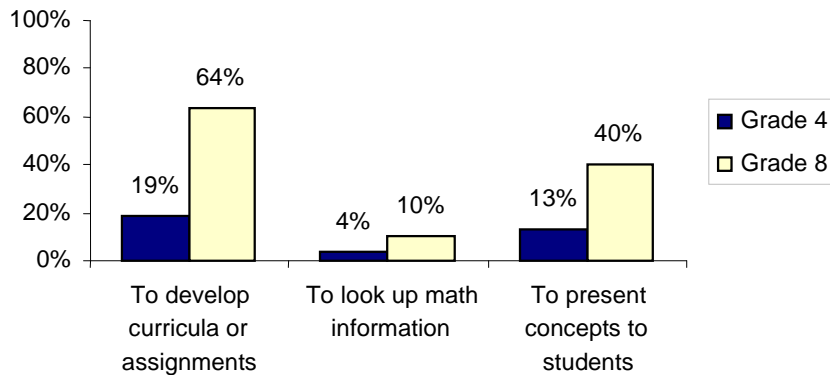


Exhibit reads: In New York, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 64 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

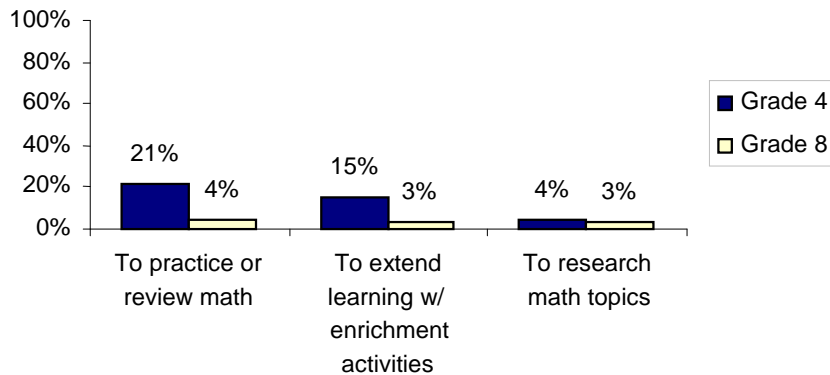


Exhibit reads: In New York, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 21 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

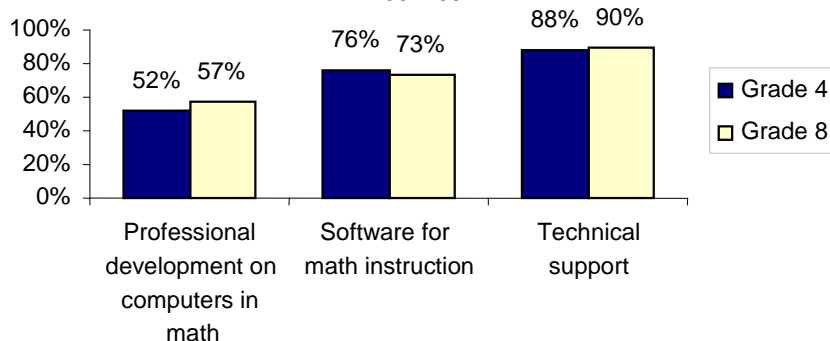


Exhibit reads: In New York, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 52 percent to 90 percent.

North Carolina: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

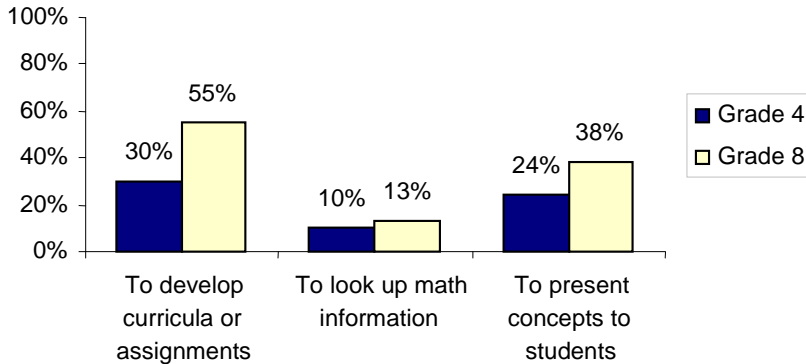


Exhibit reads: In North Carolina, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 55 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

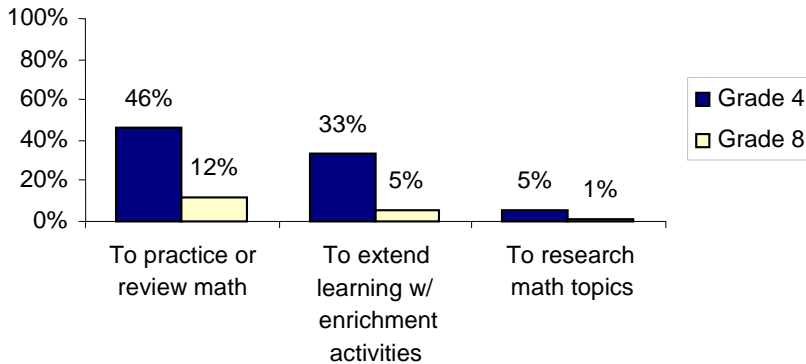


Exhibit reads: In North Carolina, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 46 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

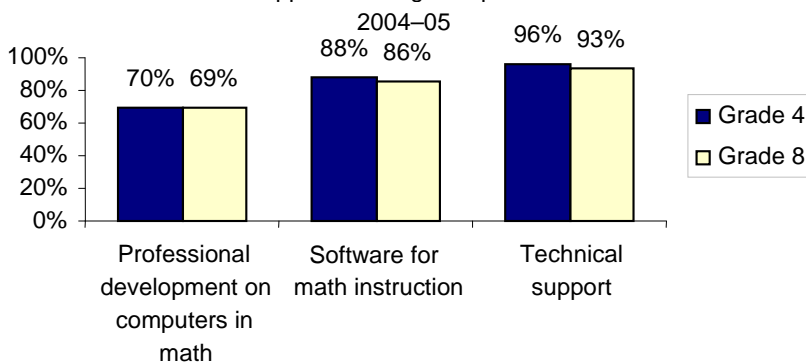


Exhibit reads: In North Carolina, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 69 percent to 96 percent.

North Dakota: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

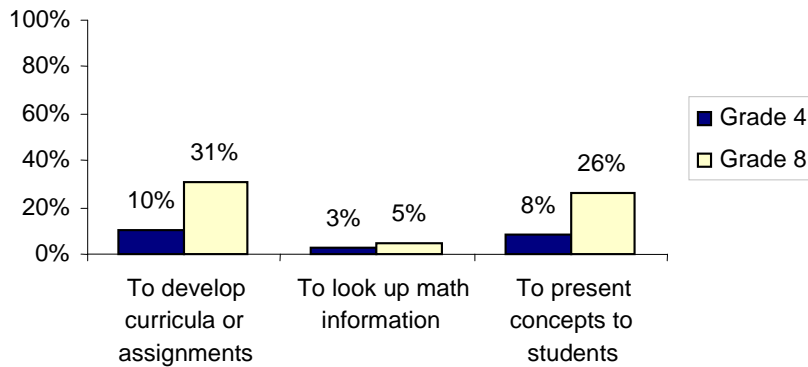


Exhibit reads: In North Dakota, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 3 percent to 31 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

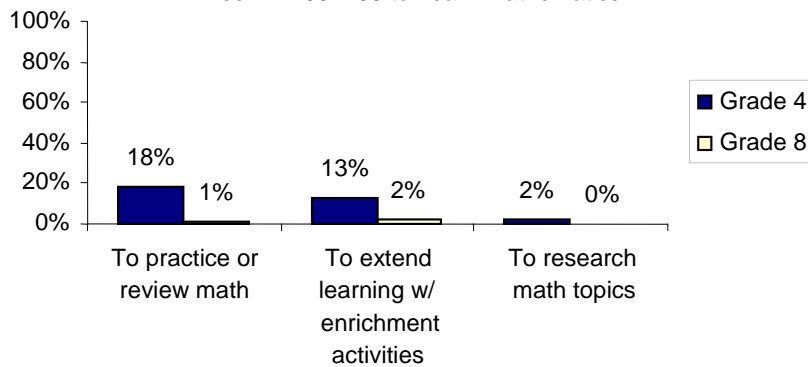


Exhibit reads: In North Dakota, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 18 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

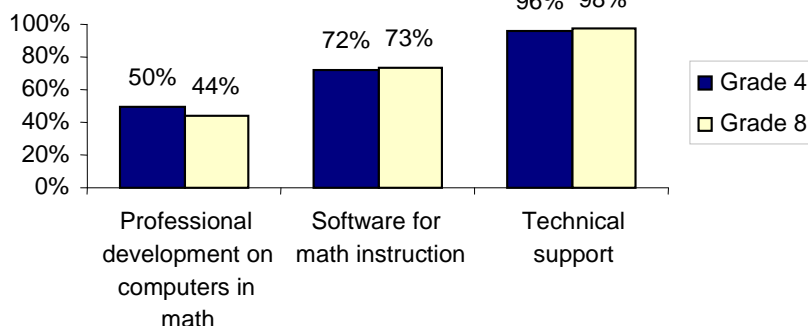


Exhibit reads: In North Dakota, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 44 percent to 98 percent.

Ohio: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

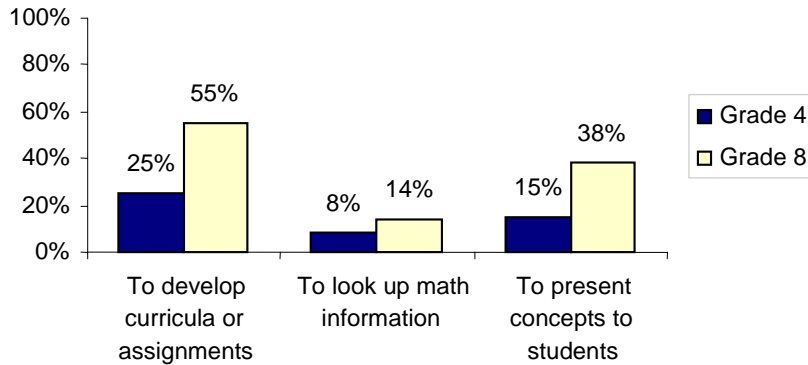


Exhibit reads: In Ohio, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 55 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

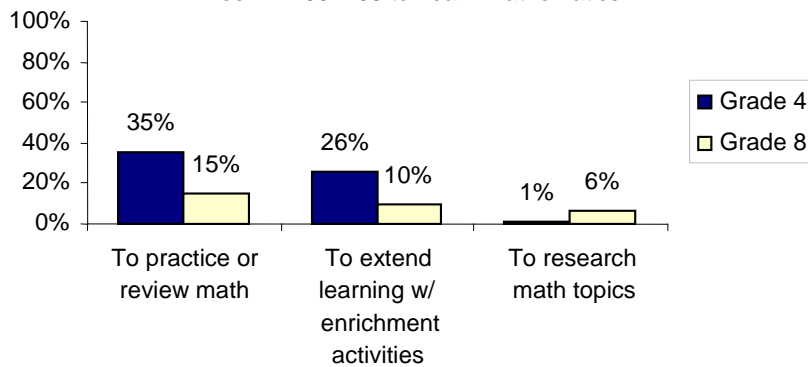


Exhibit reads: In Ohio, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 35 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

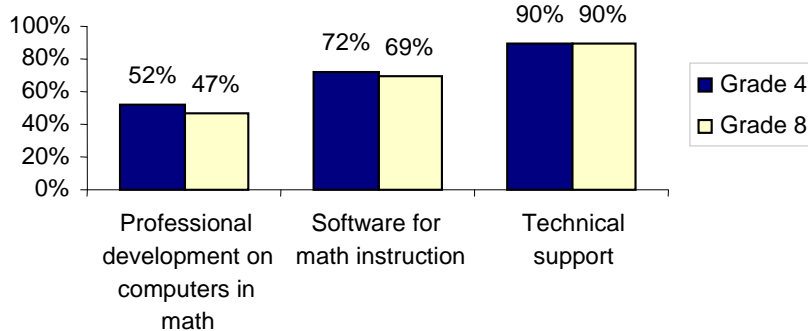


Exhibit reads: In Ohio, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 47 percent to 90 percent.

Oklahoma: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

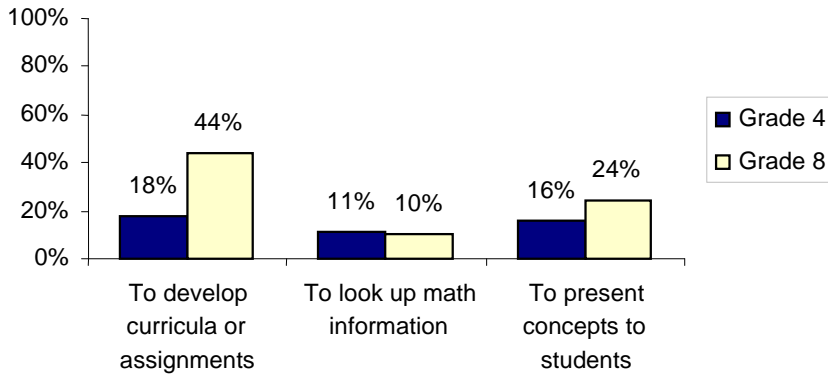


Exhibit reads: In Oklahoma, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 44 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

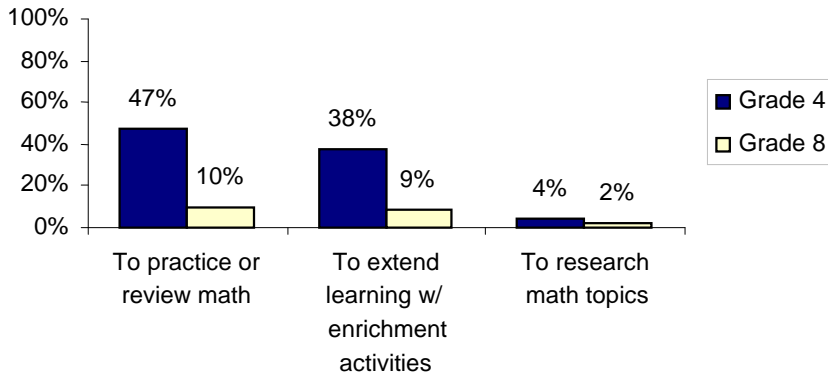


Exhibit reads: In Oklahoma, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 47 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

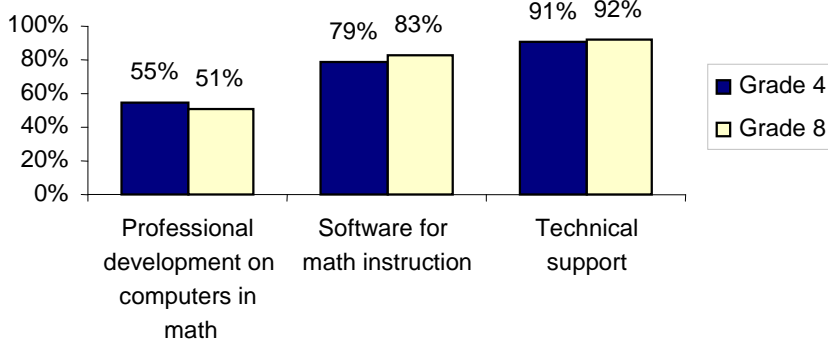


Exhibit reads: In Oklahoma, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 51 percent to 92 percent.

Oregon: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

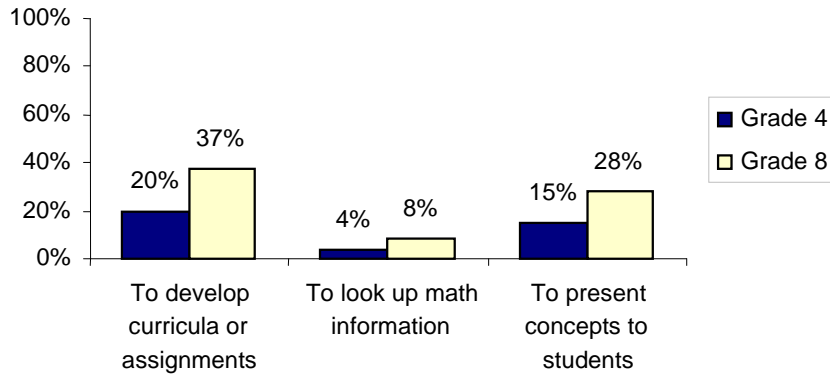


Exhibit reads: In Oregon, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 37 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

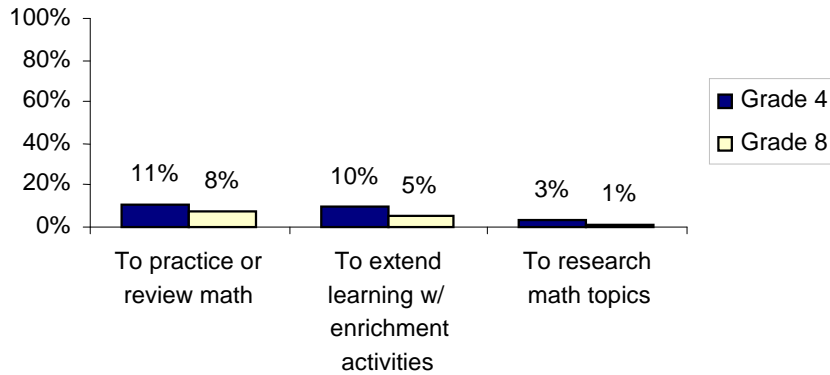


Exhibit reads: In Oregon, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 11 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

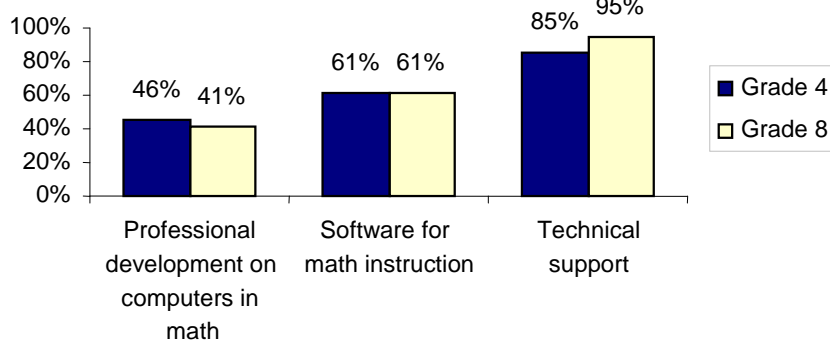


Exhibit reads: In Oregon, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 41 percent to 95 percent.

Pennsylvania: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

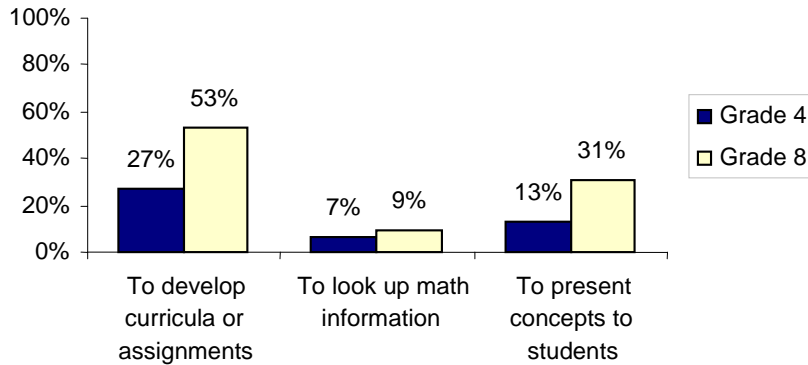


Exhibit reads: In Pennsylvania, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 53 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

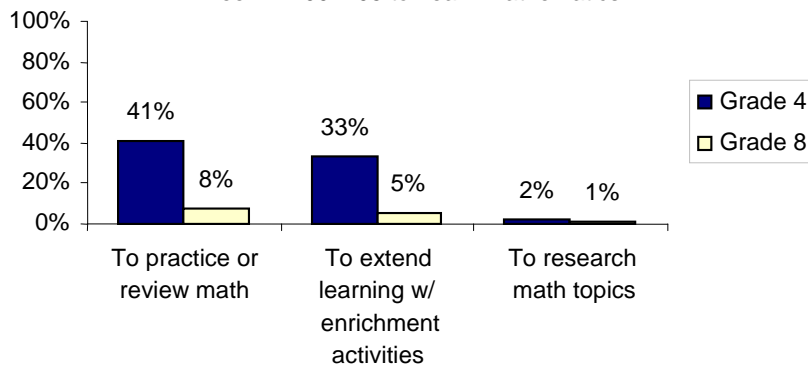


Exhibit reads: In Pennsylvania, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 41 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

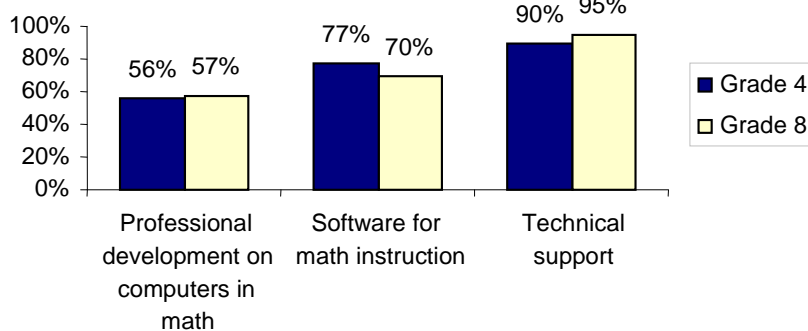


Exhibit reads: In Pennsylvania, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 56 percent to 95 percent.

Puerto Rico: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Data are not available for Puerto Rico.

Rhode Island: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

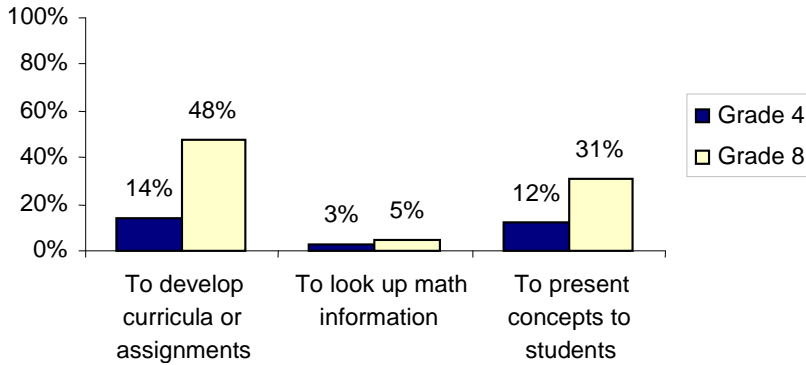


Exhibit reads: In Rhode Island, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 3 percent to 48 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

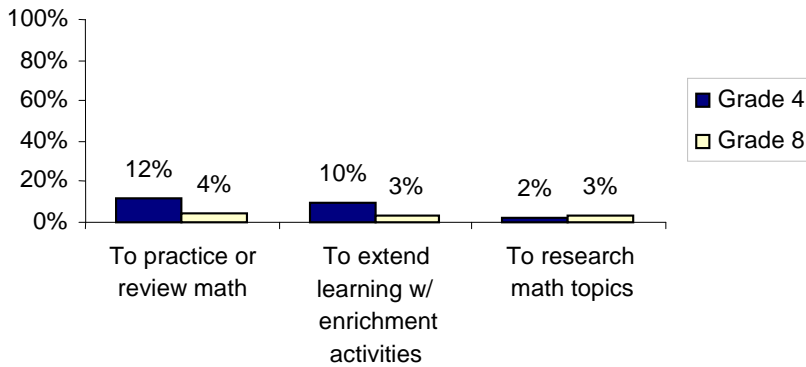


Exhibit reads: In Rhode Island, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 12 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

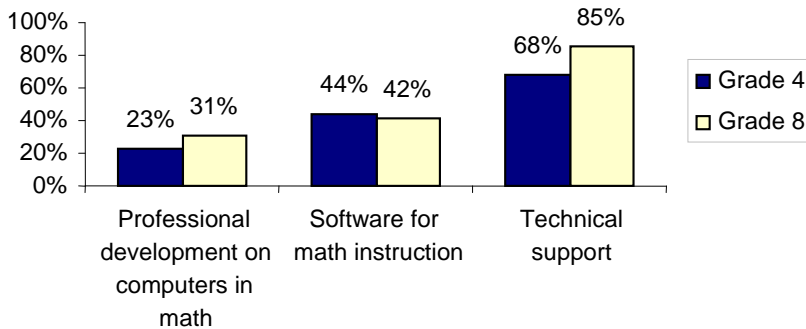


Exhibit reads: In Rhode Island, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 23 percent to 85 percent.

South Carolina: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

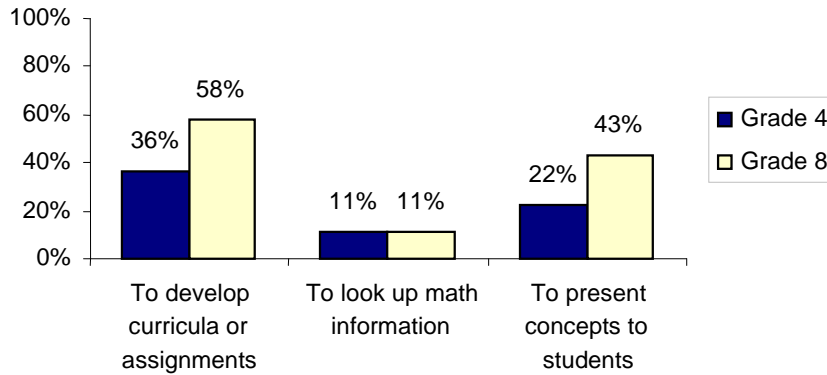


Exhibit reads: In South Carolina, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 11 percent to 58 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

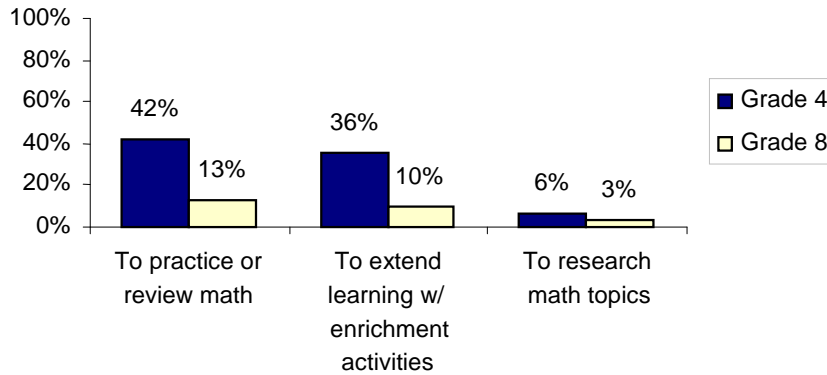


Exhibit reads: In South Carolina, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 42 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

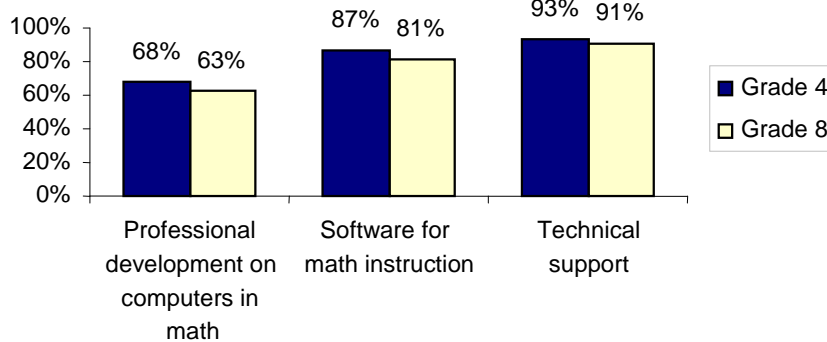


Exhibit reads: In South Carolina, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 63 percent to 93 percent.

South Dakota: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

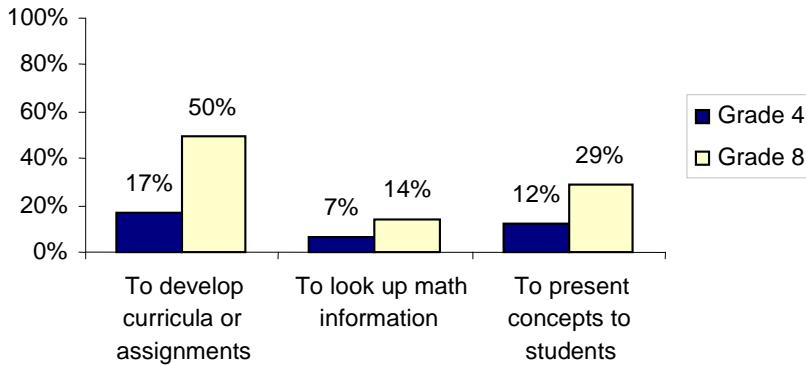


Exhibit reads: In South Dakota, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 50 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

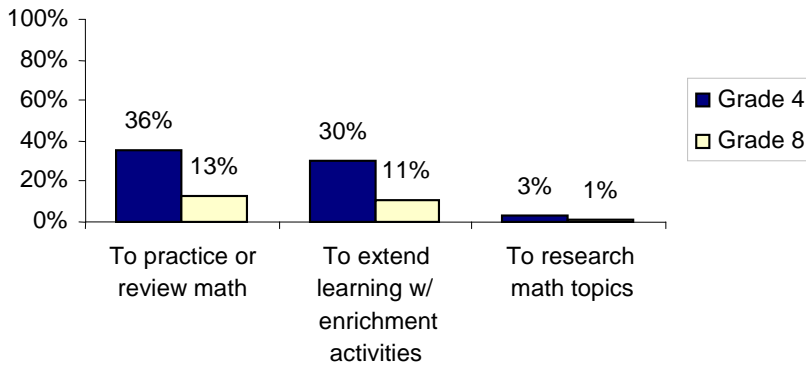


Exhibit reads: In South Dakota, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 36 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

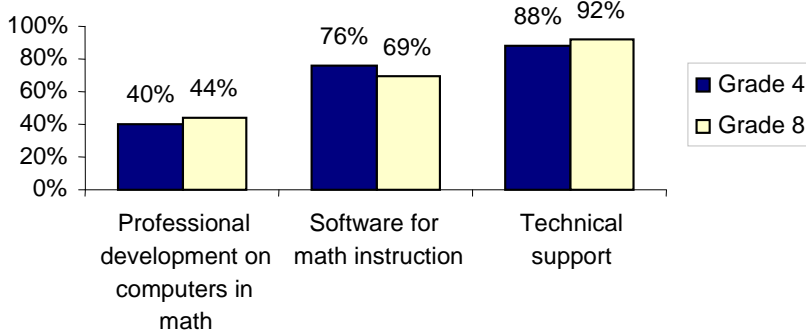


Exhibit reads: In South Dakota, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 40 percent to 92 percent.

Tennessee: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

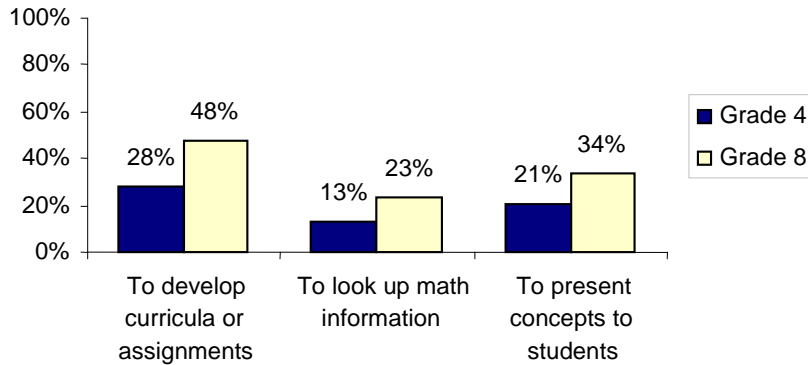


Exhibit reads: In Tennessee, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 13 percent to 48 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

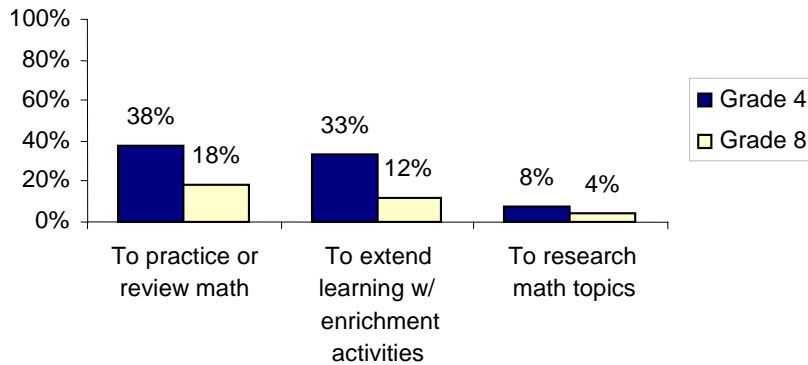


Exhibit reads: In Tennessee, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 4 percent to 38 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

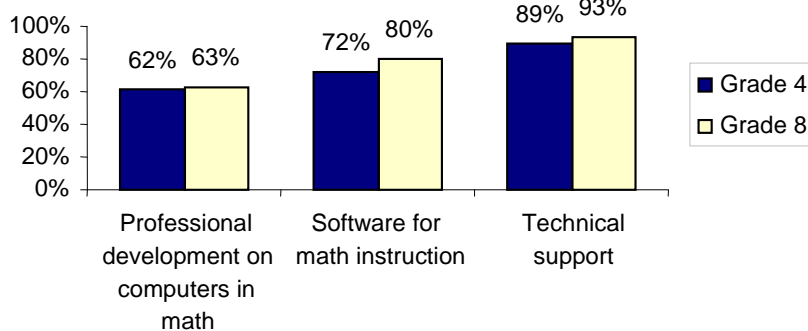


Exhibit reads: In Tennessee, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 62 percent to 93 percent.

Texas: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

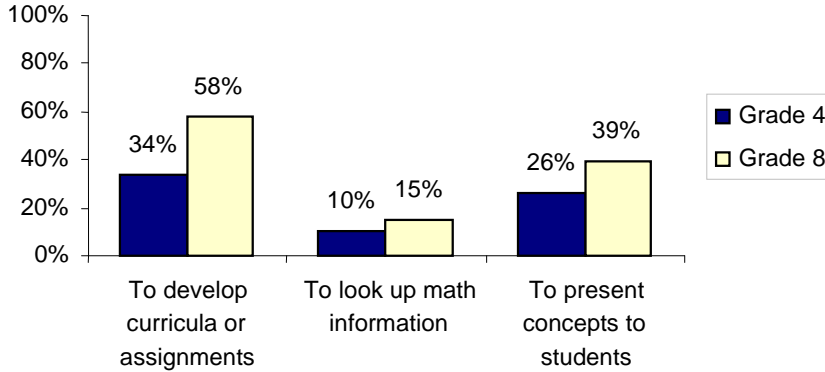


Exhibit reads: In Texas, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 58 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

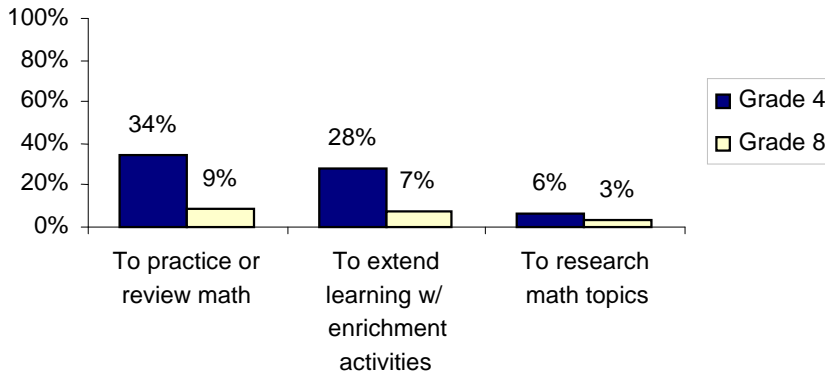


Exhibit reads: In Texas, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 3 percent to 34 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

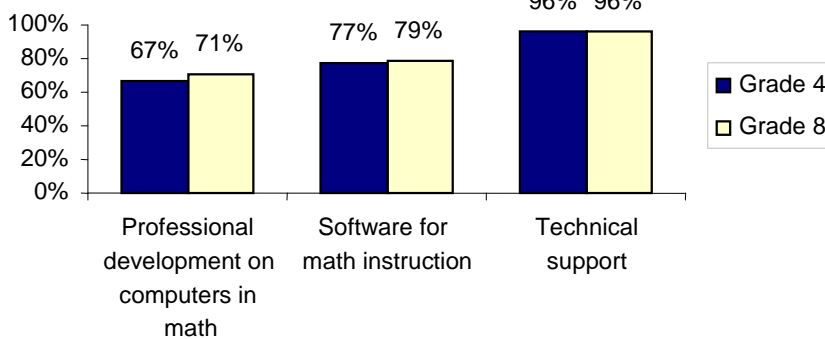


Exhibit reads: In Texas, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 67 percent to 96 percent.

Utah: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

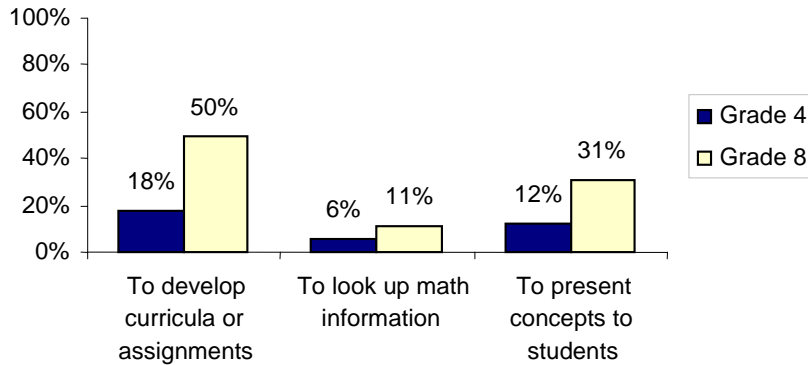


Exhibit reads: In Utah, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 6 percent to 50 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

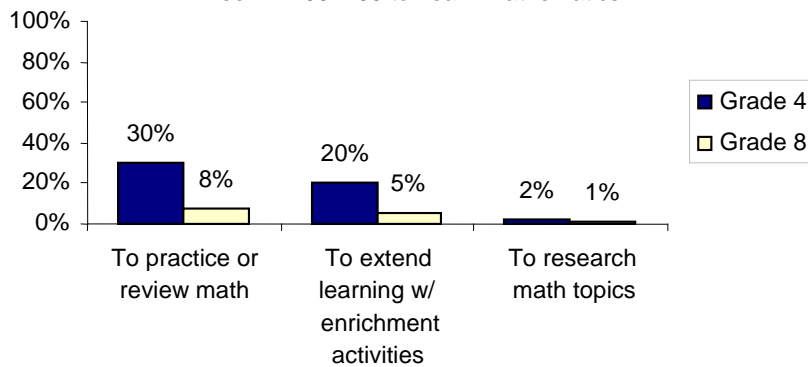


Exhibit reads: In Utah, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 30 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

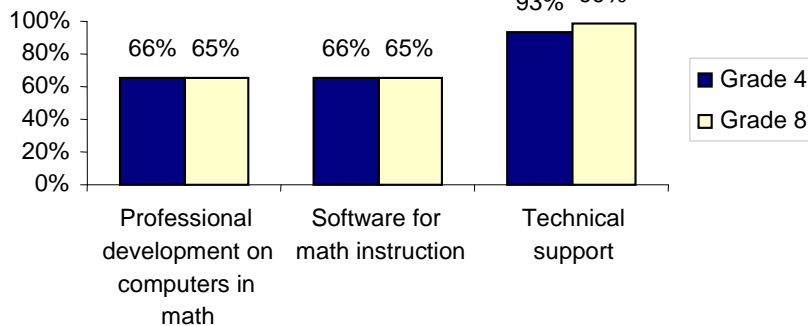


Exhibit reads: In Utah, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 65 percent to 99 percent.

Vermont: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

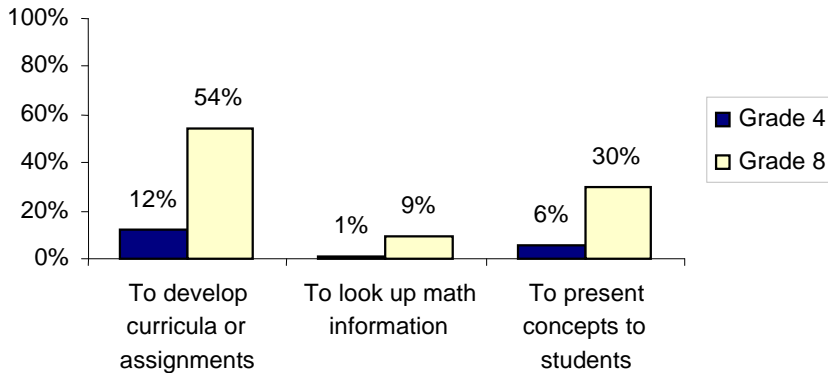


Exhibit reads: In Vermont, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 1 percent to 54 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

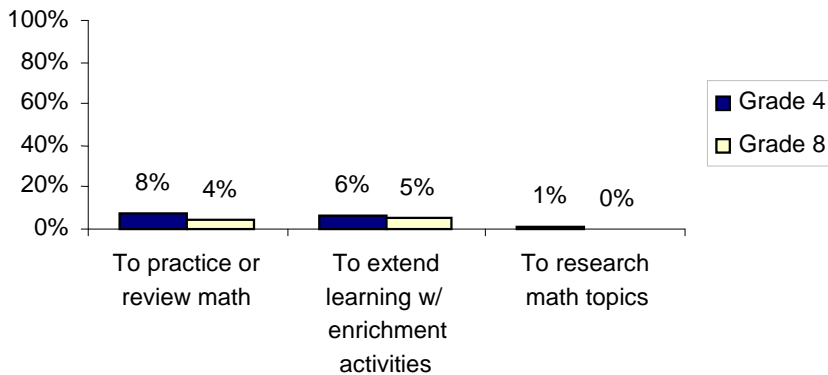


Exhibit reads: In Vermont, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 0 percent to 8 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

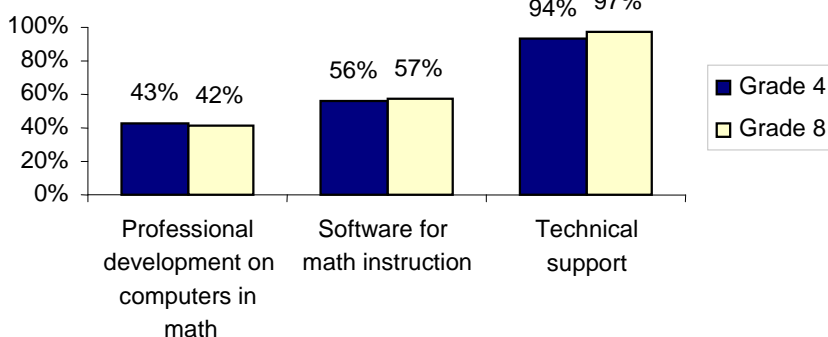


Exhibit reads: In Vermont, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 42 percent to 97 percent.

Virginia: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

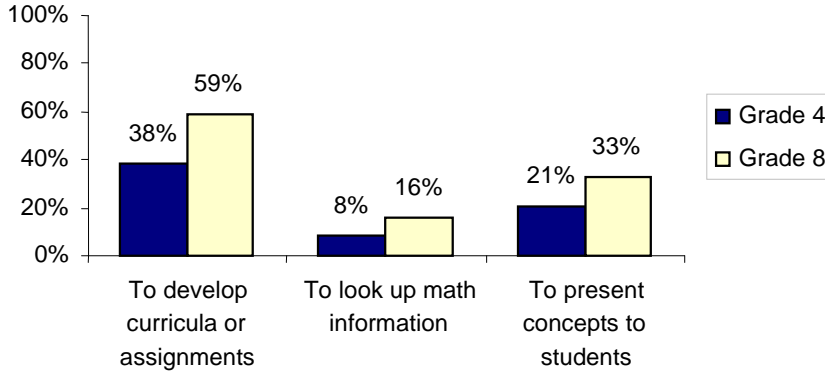


Exhibit reads: In Virginia, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 8 percent to 59 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

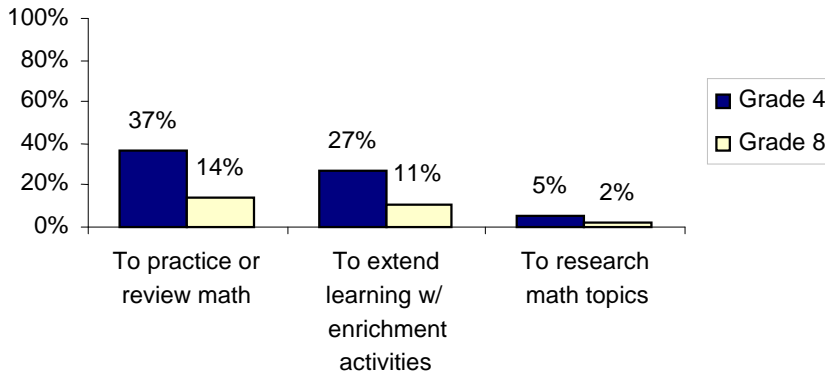


Exhibit reads: In Virginia, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 2 percent to 37 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

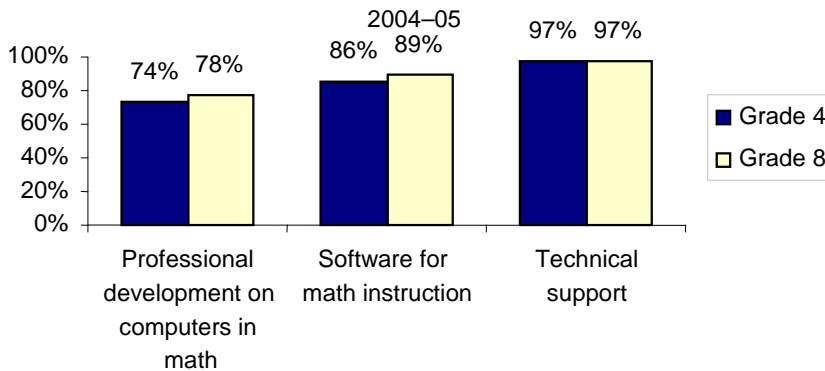


Exhibit reads: In Virginia, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 74 percent to 97 percent.

Washington: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

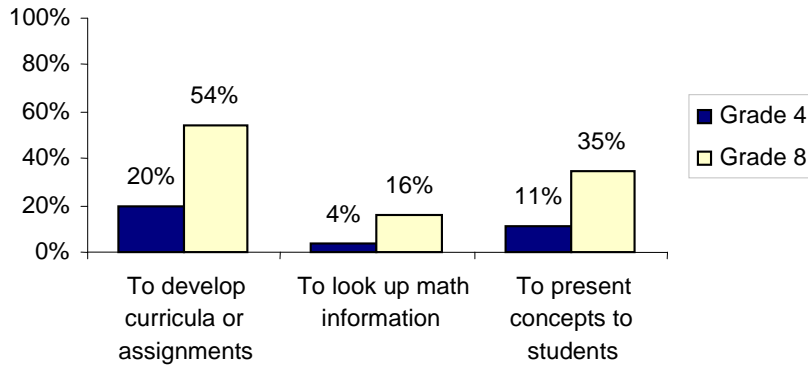


Exhibit reads: In Washington, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 54 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

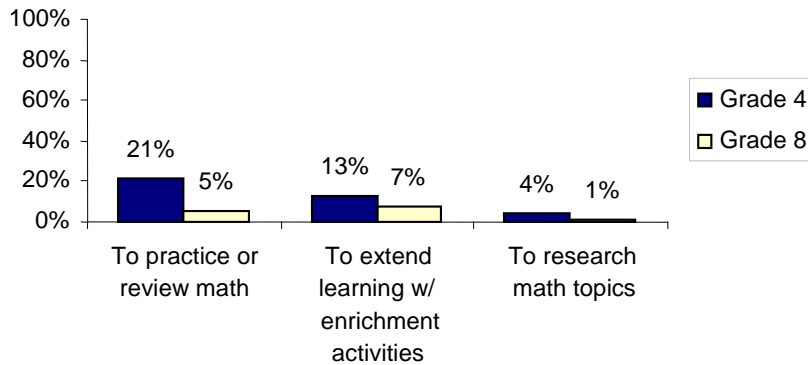


Exhibit reads: In Washington, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 21 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

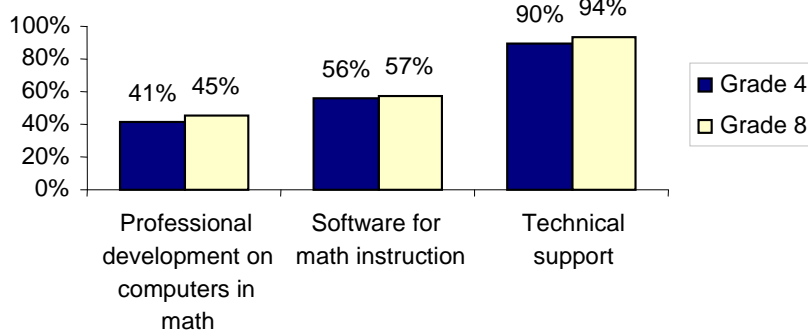


Exhibit reads: In Washington, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 41 percent to 94 percent.

West Virginia: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

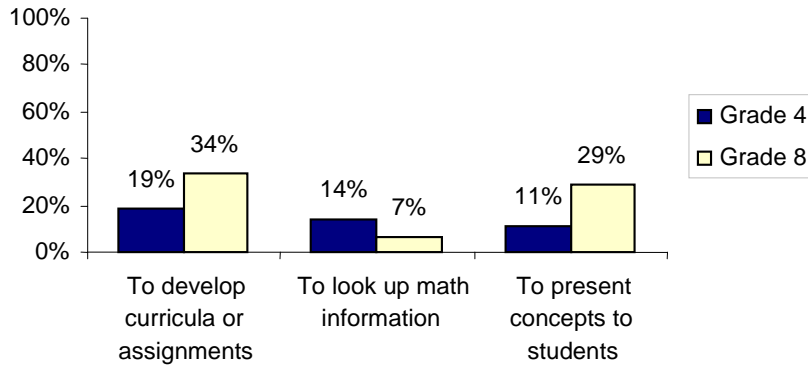


Exhibit reads: In West Virginia, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 7 percent to 34 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

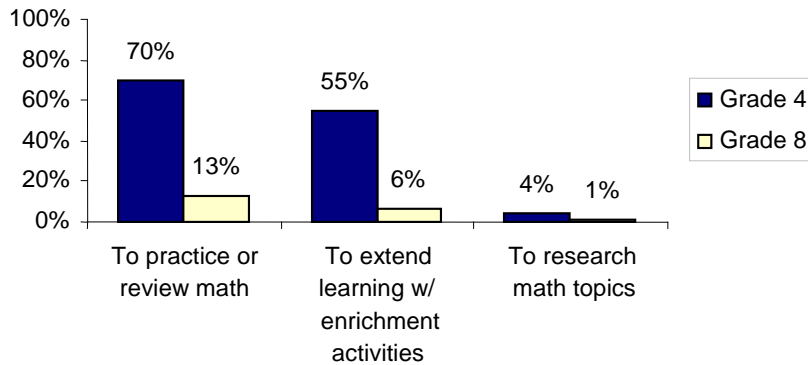


Exhibit reads: In West Virginia, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 70 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

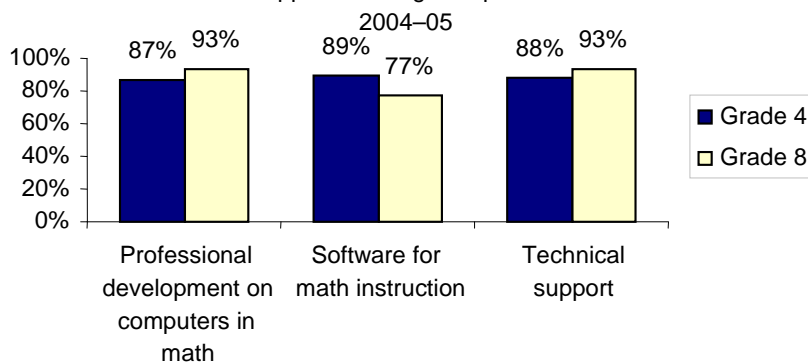


Exhibit reads: In West Virginia, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 77 percent to 93 percent.

Wisconsin: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

Percent of Students Whose Teachers Used Computers in Mathematics Instruction at Least Once a Week in 2004–05

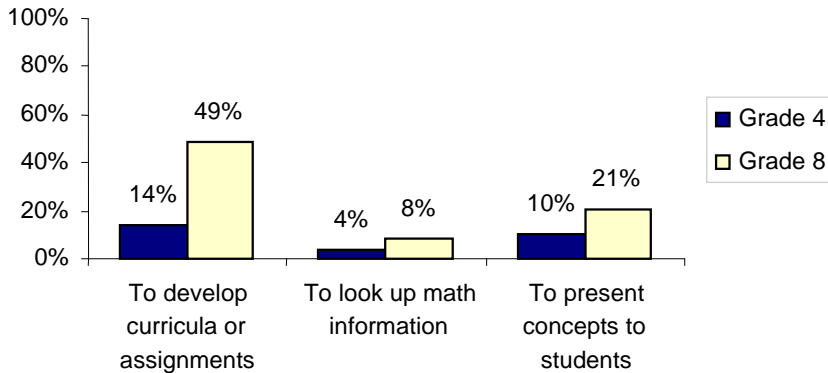


Exhibit reads: In Wisconsin, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 4 percent to 49 percent for the two grades and three different activities.

Percent of Students Who Used Computers at Least Once a Week in 2004–05 to Learn Mathematics

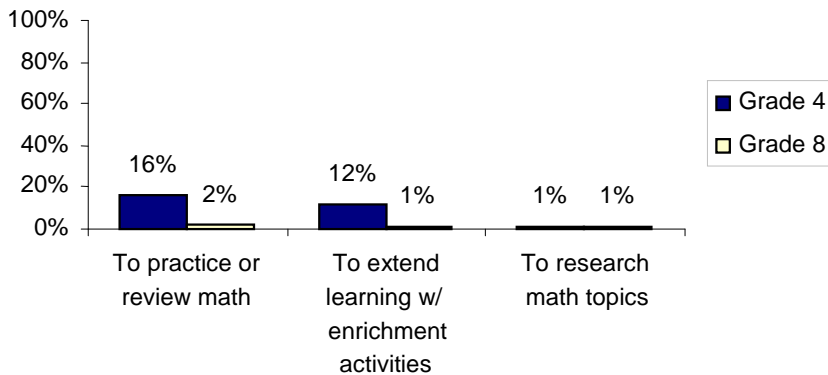


Exhibit reads: In Wisconsin, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 16 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

Percent of Students Whose Teachers had Access to Software and Support in Using Computers in Mathematics in 2004–05

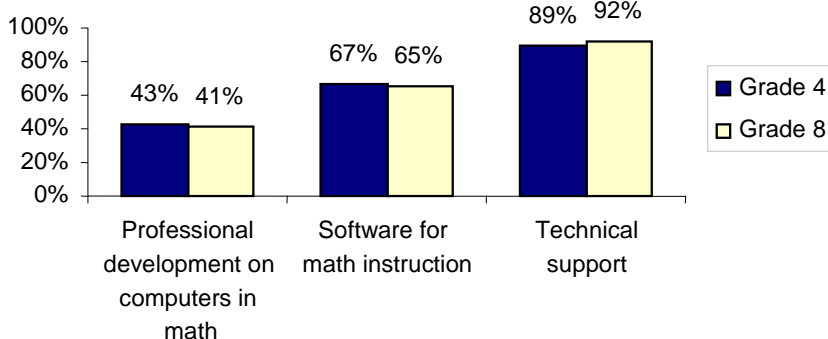


Exhibit reads: In Wisconsin, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 41 percent to 92 percent.

Wyoming: Technology for Mathematics Instruction

EDUCATIONAL TECHNOLOGY ACCESS AND INTEGRATION

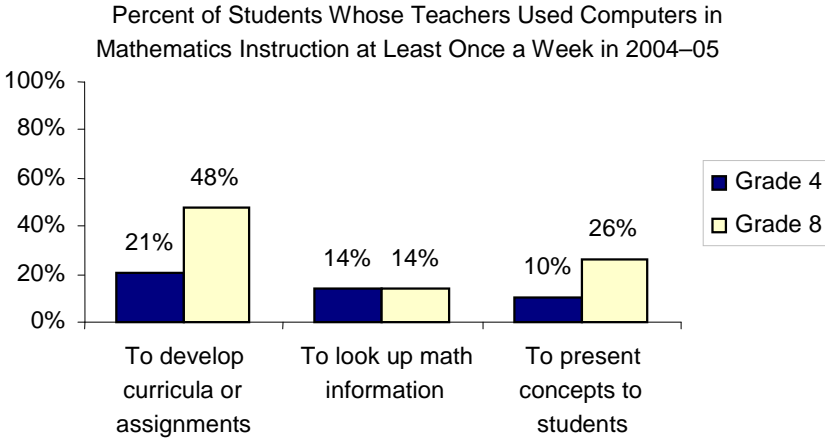


Exhibit reads: In Wyoming, the percentages of fourth- and eighth-grade students whose teachers used computers at least once a week to develop mathematics curricula or assignments, to look up mathematics information, or to present mathematics concepts to students ranged from 10 percent to 48 percent for the two grades and three different activities.

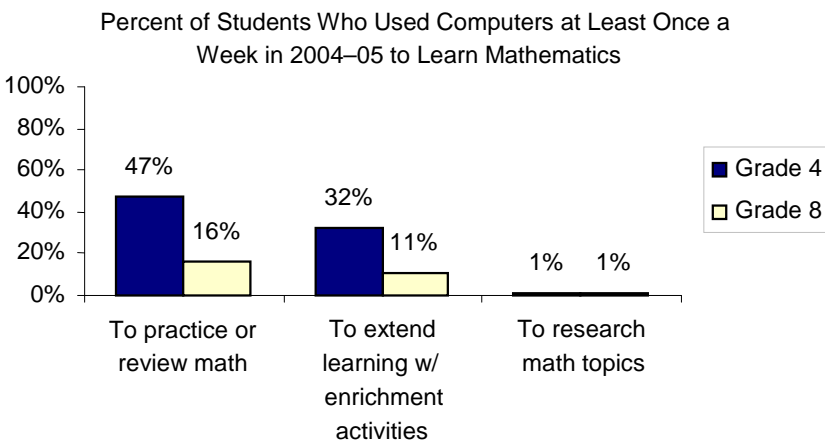


Exhibit reads: In Wyoming, the percentages of fourth- and eighth-grade students who used computers at least once a week to practice or review mathematics topics, to extend mathematics learning with enrichment activities, or to research mathematics topics ranged from 1 percent to 47 percent for the two grades and three different activities.

Note: Eighth-grade student data are presented for students in their teachers' least advanced mathematics classes. Data for students in their teachers' most advanced classes are similar (within 5 percentage points).

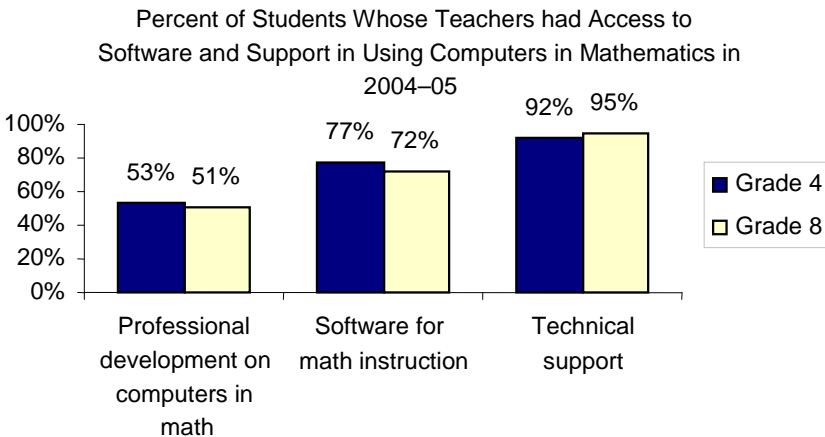


Exhibit reads: In Wyoming, the percentages of fourth- and eighth-grade students whose teachers had access to professional development on computers in math, software for math instruction, and technical support in their schools or districts ranged from 51 percent to 95 percent.

REFERENCES

Grigg, W., Lauko, M., and Brockway, D. (2006). *The nation's report card: Science 2005*.
Washington, D.C.: U.S. Department of Education, National Center of Education Statistics.

National Center for Education Statistics. (2005). *NAEP mathematics 2005 state snapshot reports*.
Washington, D.C.: Author.

National Center for Education Statistics. (2006). *NAEP science 2005 state snapshot reports*.
Washington, D.C.: Author.

Perie, M., Grigg, W., and Diaon, G. (2005). *The nation's report card: Mathematics 2005*.
Washington, D.C.: U.S. Department of Education, National Center of Education Statistics.

APPENDIX A
REPORT METHODOLOGY

NAEP Administration Data from 2005

This report presents data from the 2005 administration of the National Assessment of Educational Progress (NAEP), which has tracked student learning since 1969. NAEP assesses what the nation's students know and can do in a variety of subjects. Nationwide assessments have been conducted since 1969; state-level assessments have taken place since 1990. In 2005, student performance in fourth- and eighth-grade mathematics was examined, along with performance in other subjects. NAEP additionally collected data from teachers on their professional development opportunities, on their classroom practices, and on their use of instructional technology. Teachers completed NAEP surveys describing their use of technology in teaching and learning of mathematics.

The NAEP online data reporting tool, called the NAEP Data Explorer (<http://nces.ed.gov/nationsreportcard/nde/>), was used to examine data on topics of interest to this report, including the availability of computers, software, and technical support in schools; the use of technology in mathematics curriculum planning; the integration of technology into teaching and learning in mathematics; the availability of technology-related teacher professional development in mathematics; and the use of technology in classroom-based assessment. The Data Explorer provides teacher response data as percentages of students whose teachers have access to particular resources or use particular practices. The Data Explorer provides student-level data because these paint more accurate pictures of students' educational contexts than would teacher-level data.

Data were extracted for this report at the national level and on a state-by-state basis. The national-level data include information on educational technology access and use from all 50 states and the District of Columbia and were obtained by collapsing the state jurisdictions on the NAEP Data Explorer for each variable. The individual state estimates were extracted separately and used for both the analyses in the body of this report and the section on each state's educational technology access and integration in the state profiles. Response categories indicating the frequency of technology use were collapsed to reflect weekly use of technology for math instruction, and categories indicating technology access were collapsed to reflect the availability of one computer for every four or fewer students.

Elements for Individual State Profiles

Three sets of measures of educational technology access and integration are presented in the individual state profiles. The data about educational technology access and integration into mathematics classrooms were taken from the NAEP 2005 database that was already described. Three graphs show the percentages of students in the fourth- and eighth grades whose classrooms include access to and use of technology in school year 2004–2005. The first graph shows the percentages of students whose teachers used computers in mathematics instruction at least once a week. The second graph shows the percentages of students who used computers to learn mathematics at least once a week. The third graph shows the percentages of students whose teachers had access to software and support in using computers in mathematics.

Exhibit A-1. Educational Technology Access and Integration

Technology-Related Activity	Teacher Use of Computers in Mathematics Instruction
Develop curricula or assignments	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 9c. Grade 8: Survey Question 8c.
Look up math information	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 9b. Grade 8: Survey Question 8b.
Present concepts to students	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 9a. Grade 8: Survey Question 8a.
	Student Use of Computers to Learn Mathematics
Practice or review math	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 8a. Grade 8: Survey Question 7a.
Extend learning with enrichment activities	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 8b. Grade 8: Survey Question 7b.
Research math topics	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 8c. Grade 8: Survey Question 7c.
	Teacher Access to Software and Support in Using Computers in Mathematics
Professional development on computers in math	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 12. Grade 8: Survey Question 11.
Software for math instruction	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 11. Grade 8: Survey Question 10.
Technical Support	U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2005 Mathematics Assessment. Grade 4: Survey Question 10. Grade 8: Survey Question 9.



Our mission is to ensure equal access to education
and to promote educational excellence throughout the nation.

www.ed.gov